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# RELATIVE PERMANENCE OF FORMER BOUNDARIES IN INDIA

By Winifred M. Day

While the study of boundaries has been undertaken by Political Geographers with reference to European and American examples, references to Asia have not been numerous, though India's long and connected history—prior to the partition of 1947—presents a wide field for investigation. In view of the immensity of the field awaiting attention, this communication will be confined to an examination of political and administrative boundaries during certain historical periods, namely, those of the Hindu and Mughul Empires.

At the outset, however, we must notice three major factors which limit the accuracy of any attempt to reconstruct the historical and political geography of India during the Hindu and Mughul periods.

Firstly, there have been widespread changes in the coastline and in river systems within historic times. Most important are : the subsidence along the Tinnevelly coast ; the westward migration of the Indus river—the ancient 'Sind-Hind' boundary ; the formation of the present Indus and Ganges deltas ; the virtual disappearance of the Hakra-Wahinda river system ; and the numerous alterations of water courses across the Indo-Gangetic plains. All these changes make it difficult to say where certain recorded boundaries were located. The advice of a well-known historian is strongly applicable to the Historical Geographer, and his words have to be kept firmly to the forefront : "The careful investigator needs to be continually on his guard against the invidious deceptions of the modern map." [1]

Secondly, the past extent of the forest and jungle is undetermined. The limit in any particular district, especially in those off the regular routes of foreign travellers and imperial armies, can only be approximate.

Thirdly, until well into the nineteenth century, Indian history consists of three separate histories : that of India north of the Nerbudda river, India south of the Kistna river, and of the intervening lands.

The difficulty resulting from this separateness of north and south

is at once apparent when we turn to the first of our chosen periods, namely, India of the great Hindu empires of the period 322 B.C. to A.D. 640.

In India of the fourth century B.C. there were two main zones of prosperous agricultural population : on the Indo-Gangetic plains, and on the lowlands of southern peninsular India. In the west, these were separated by the Sind desert and Aravalli hills, and in the east, by a belt of hill and forest. Wedged between these lay the main north-south routeway through Malwa to the west coast.

The term ' Indian ' can hardly be applied to these two peoples, for though Hinduism, with its characteristic caste system, was firmly established amongst both, they differed so widely in language and culture that the much maligned terms ' Hindu-Aryan ' and ' Hindu-Dravidian ' are perhaps more applicable.

Though the defined and demarcated political boundary line did not appear in India until introduced by the British in the eighteenth and nineteenth centuries, yet by the time of the establishment of the Mauryan Empire at the beginning of the fourth century B.C. three main orders of boundaries [2]—local, regional, and state—were in use in India.

*Village Boundaries.*—There is reason to believe that in Northern India the village community was within definite demarcated boundary *lines*; and that boundary disputes were settled on the evidence of sworn witnesses with " earth on their heads wearing chaplets of red flowers and clad in red garments." [2]

*Regional Units.*—Assemblages of villages were used as administrative units within the most densely populated and highly organised states such as Magadha—the centre of the later Mauryan Empire—and the Chola State of South India.

*Interstate Boundaries* as such did not yet exist, but more progressive Mauryan States exercised jurisdiction over recognisable and fairly stable areas concerning whose limits some facts are known. These limits frequently coincided with recognisable physical features — *e.g.* the prosperous east coast state of Kalinga was limited westwards by the foot of the Eastern Ghauts. The rivers of the Indo-Gangetic plains provided convenient limits for such kingdoms as Taxila, Magadha, and Kosala. Often, however, these embryo states were bounded from each other simply by retaining unoccupied zones — a no-man's-land of waste, comparable to the marks and marshes of early mediaeval Europe. To these three orders of boundary, the establishment of the Mauryan Empire—roughly contemporary and sometimes compared with the Roman Empire—added a fourth : the frontiers of the Empire itself. Here we may note the varying stability and the varying causes of the fluctuation of the imperial frontiers.

These boundaries, at three periods from 250 B.C. to A.D. 640, are shown in Fig. 1.

The *western frontier* shows the widest fluctuations. For almost two hundred years, until the invasion by Alexander the Great (326 B.C.), the Indus formed the boundary. In 303 B.C., by treaty with Seleukos Nikator, the Mauryan Empire included much of Afghanistan and

Baluchistan, while north west the natural barrier of the Hindu Kush formed the boundary. By A.D. 640 there was a definite detraction eastwards, due mainly to White Hun invasions and the increasing desiccation of the formerly fertile Indus valley.

The *northern frontier* remained the most stable, for here were two contrasting landscapes—fertile plains and submontane forests. The only fluctuations occurred where the naturally fortified intermont

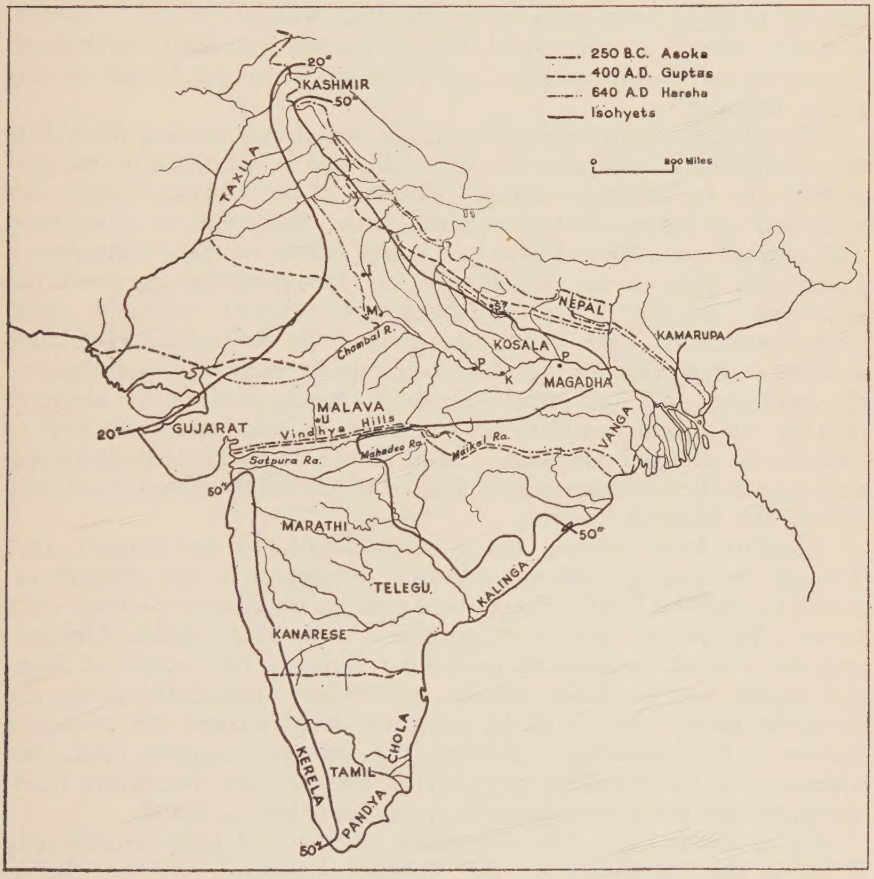


Fig. 1. Early India. Compiled from V. A. Smith's maps of the empires of Asoka, the Guptas, and Harsha, and with reference to Elphinstone's map of Ancient India.

valley kingdoms of Kashmir and Nepal defied conquest. In fact, this may be regarded as the most enduring frontier in the early and mediaeval history of India.

In contrast are the wide fluctuations of the *eastern frontier*, closely connected with the frequently changing courses of rivers, and with immigration through the passes of the north-eastern hills.

The apparent stability of the *southern frontier*—shown in Fig. 1—is probably illusory, for we have little detailed information of its exact

position. The only delimited line recorded was the latest, that of the Nerbudda river as the southern boundary of Harsha's Empire by agreement with the victorious Chalukya Chief of the western Deccan. The southern boundary of the other empires may have followed either "The River"—the Nerbudda, regarded by the Marathi-speaking peoples as the traditional northern limit of the Deccan ; or it may have followed the line of the Vindhya watershed, the traditional southern limit of Hindustan. The Satpura - Mahadeo Hills zone does not appear to have been used as an imperial frontier in any historical period ; though its three-fold barrier nature restricted north-south migration and encouraged the use of the western coastal route during peace and war.

The history of northern India in the centuries following the White Hun invasions is analogous to that of Europe in the same period and mainly due to the same causes. The fall of the Harsha Empire encouraged the encroachments of aboriginal tribes ; but so widespread and radical were the political and social effects of three centuries of chaos that little or no oral family, or clan, tradition survived the upheaval. In the period of reconstruction which followed, came closer settlement of the less fertile lands of the Rajputana Highlands and the western Deccan by a vigorous, rapidly increasing population ; the emergence of a new social unit, the Rajputs ; and, by the eleventh century, an almost complete redistribution of kingdoms, with new or extensively altered boundaries. Most of the newly created states disappeared in the Mohammedan invasions which followed, and eventually formed the Mughul Empire.

Mughul India offered many resemblances to the present day. Though the total population was only a quarter of the present, *i.e.* about 100 million,[3] yet the regions of greatest population density were, as now, located on the low-lying plains of northern India, Gujarat, and the coastal lowlands of peninsular India. The extent of forest and jungle was no doubt greater, particularly noticeable along the Gangetic plain ; but it could not there have formed the principal feature of the landscape. Gujarat, the western Gangetic plain, the southern coastal lowlands, and parts of Bengal were intensively cultivated, though the present marginal lands were less occupied.

Fig. 2 shows : (*a*) The disposition of states in 1525 immediately prior to the foundation of the Mughul Empire ; (*b*) the altered boundaries of the main independent kingdoms, and the extent of the Mughul Empire in 1561 when Akbar, the famous contemporary of Queen Elizabeth, had ruled for five years ; (*c*) the greatest extent of the Empire in 1700.

The states of 1525 varied greatly in age and character ; and it is convenient to recognise four contrasted groups :—

(1) Long-defined states which had survived the various Mohammedan invasions of the eleventh to sixteenth centuries, and *retained their individuality*, were : the almost self-sufficient valley kingdoms of Nepal and Kashmir, the coastal or peripheral Gujarat and Sind, Bengal and Orissa, and, surprisingly, the route state of Malwa which, with Orissa, longest remained independent.

(2) The states of Rajputana and the Mohammedan states of the Deccan, excepting Golkonda, were of *recent formation*, although the land had been occupied previously by powerful tribal chiefs.

(3) Golkonda—the earlier Hindu-Telugu 'Kalinga' or 'Teligana' —was an example of the states of long duration which *had not retained* their political independence.

(4) The congeries of tribal communities: The states which,

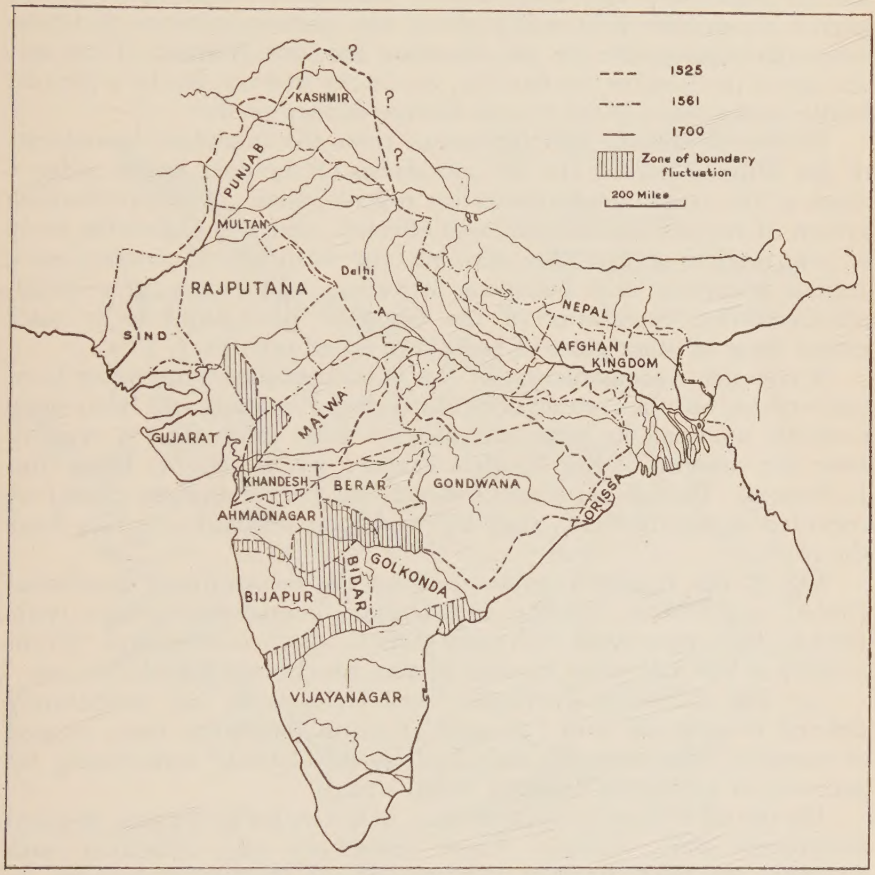


Fig. 2. Muslim India. After V. A. Smith, R. Sewell, and I. Prasad, with details drawn mainly from Abu-l-Fazl's Account of the XII Subas.

united under the Indian Boadicea, Rani Durgavati, resisted conquest by Akbar, were called Gondwana by the Mohammedans.

The cross-ruling on the map shows the areas over which the boundaries of the main independent and semi-independent states fluctuated during the period.

Apart from the mountain and forest frontiers of the Himalayas, these boundaries, which remained permanent, were partly and wholly located along rivers. Two of the most important were the rivers Chambal and Tungabadra—lower Kistna.

The former flowed through hilly ravined country—dangerous for cavalry—and separated the bare or jungle-covered hilly home of the Rajputs from the Malwa plateau.

The latter formed the northern defensive frontier of the populous wealthy Hindu Empire of Vijayanagar, which withstood Mohammedan invasion for some two centuries, 1336-1565. Strong fortifications, parallel with the southern bank of the river, were centred on the capital city Vijayanagar [5] and the immense fortress of Adoni, strategically placed on granite hills rising above the plateau surface, and pronounced impregnable by the Russian traveller Nikitin. However, the fate of the Empire was decided, not on the frontier, but by a pitched battle on the plains of the middle Kistna, further north.

No less interesting and important than the interstate boundaries of the Mughul period are the boundaries of the next lowest order—those of the regional administrative units—Subas. A comprehensive system of regional subdivision was effected, and a considerable body of information is available through the writings of contemporary Indian historians and European travellers. Moreover, the British administrative boundaries of the Gangetic plain, and to a lesser extent those of other parts of India, are based upon it.

A complete reconstruction of the Suba boundaries has never been undertaken, but the records from the United Provinces and Bihar were carefully analysed in 1854 and 1883, a little more than a century after the collapse of the Mughul Empire, by Sir H. M. Elliot and J. Beames. Though they both insisted that the conclusions should be regarded as approximate, they believed their results to be very near the truth.

Fig. 3, the United Provinces, shows the reconstituted Provincial (Suba) and District (Sarkar and Dastur) boundaries for the years 1582 to 1596, compared with their recent (1933) counterparts. From a study of this and other sources, certain conclusions may be drawn.

(1) The Suba or Provincial boundaries were not deliberately defined to coincide with 'natural' regions, for Subas were created as conquest was extended, as stated by Abu-l-Fazl,[5] introducing his accounts of the twelve Subas of Akbar's reign.

On the other hand, it appears that, in the majority of cases, physical boundaries were chosen. These sometimes also coincided with linguistic frontiers, because the self-imposed limits of conquest in general coincided with physical barriers, and because the physical boundaries of the conquered kingdoms tended to be accepted as the boundaries of the new creations. For example, the Kaimur hills provided a limitation to conquest from the Gangetic plain; and in Gujarat, and possibly in Orissa, linguistic frontiers and provincial boundaries coincided.

(2) (*a*) Of the smallest administrative units it is known that the village lands were limited by precise and enduring demarcated boundaries enclosing cultivated land and, at a later period, waste. Some of these had endured since the ninth century, and in certain parts of India, namely, the United Provinces, Bihar, Orissa, and the Madras Presidency, they became the basis of the British

territorial divisions. In some districts, the first British Settlement officers based their maps almost entirely on these traditional boundaries pointed out to them in the field.

(*b*) In the Mughul Empire village lands were grouped to form mahals—or parganas.[3] In Rajput or Buddhist areas mahals of 64 or 100 villages were common ; elsewhere 360 was a frequent choice. A small number of mahals (or parganas) grouped together formed a sarkar or dastur, *i.e.* a district. The mahal was a revenue unit and the essential part about it was that it *contained* so many villages, that is to say, so much measured and taxable land, but the mahal and sarkar

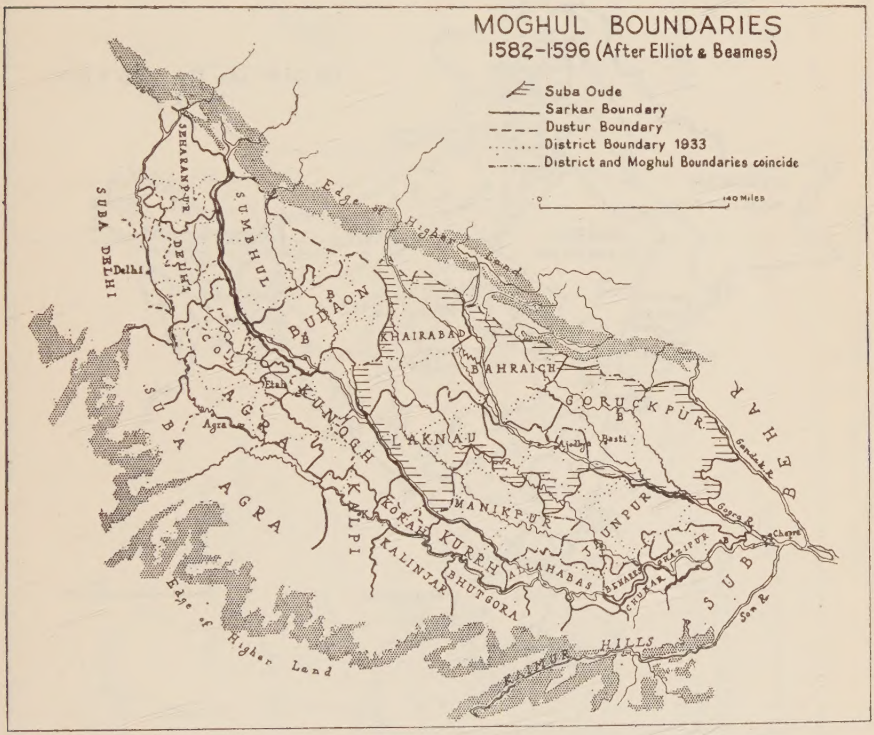


Fig. 3. A comparison of Mughul and present (1933) divisions within the United Provinces.

were usually extended to some marked feature of the physical landscape traditionally accepted as a boundary. Minor streams, deserted river channels, cut-banks, and the mid-lines and deepest channels of larger rivers were all used, customs varying with locality.

These Mughul administrative and political boundaries were important features of Indian economic life. Customs duties, river tolls, ferry fees, and overland transit duties were important sources of revenue to both the Mughul and Vijayanagar rulers. And as part of the working system they were subject to change in order to facilitate revenue collection and, more rarely, to effect geographical unity.

Other changes resulted from grants of land, and yet others were forced by the continual alteration in river courses.

The history of boundaries in India to the decline of the Mughul Empire in 1707 can be seen as a twice-repeated sequence of a period of great fluctuations mainly due to war, and a period of stability under a settled government. Broadly the sequence was repeated under British rule : the period of fluctuation lasting until after the Mutiny in 1857, and the period of stability from 1857 to 1947. A further, but modified, repetition is just beginning again. The two years since

Fig. 4. India and Pakistan, 1949. Compiled from Government of India publications.

August 1947 have seen not only the partition of the sub-continent of India, but the elimination of certain interstate boundaries (Fig. 4), the use of force in Hyderabad, and actual military operations in Kashmir.

In war or peace, the one enduring unit within its traditionally recognised or demarcated boundaries has been the village. To quote Mountstuart Elphinstone [4] : " Among all these changes townships remain entire, and are indestructible atoms, from an aggregate of which the most extensive Indian Empires are composed."

The features discussed may form some basis for judgment as to what in the present phase of flux is ephemeral and as to what has already long endured the forces of change and may again survive.

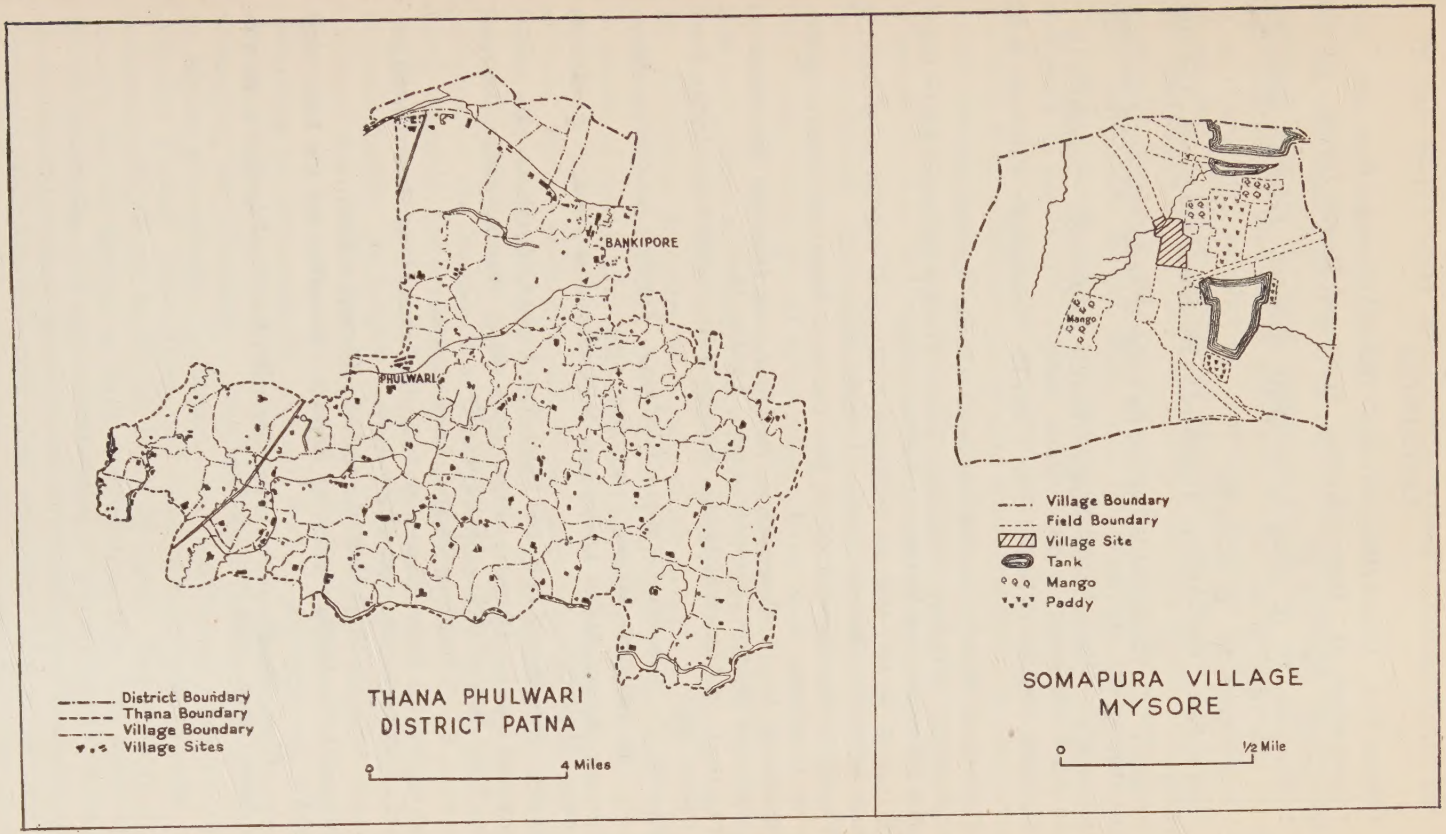


Fig. 5. Examples of village boundaries.

## REFERENCES

[1] Smith, V. A. Oxford History of India. Oxford : Clarendon Press, 1923. p. iv.

[2] Elphinstone, M. History of India : Hindu and Mughul Periods. 4 Books. London., 1905. Book I, p. 36.

[3] Moreland, W. H. India at the Death of Akbar. London : Macmillan and Co. Ltd., 1920. p. 22.

[4] Elphinstone, M. *op. cit.*, p. 67.

[5] Abu-l-Fazl. Ain-i-Akbari. Translated by Blockmann and Jarrett. Calcutta, 1875-1891.

Beames, J. On Geography of India in the Reign of Akbar. *Journal of the Asiatic Society*, 1884, 53 (*1*) ; 54 (*1*).

Bernier, F. Travels in the Mughul Empire (1656-1668). Translated by I. Brock and W. Pickering. 2 vols. London, 1826.

Cambridge History of India. Vols. I and II. Cambridge : University Press, 1922.

Cunningham (Gen.). Ancient Geography of India. London, 1871.

Dunbar, G. A History of India from Earliest Times to the Present Day. Vol. I. London : Nicholson and Watson. 3rd edition, 1943.

Elliot, Sir H. M. Memoirs on History, Folklore, and Distribution of Races in India. Edited by J. Beames. 2 vols. London, 1869.

Fryer, J. New Account of the East Indies of Persia (1672-1681). 3 vols. London, 1905-1915.

Hamilton, W. A Geographical, Statistical, and Historical Description of Hindustan and Adjacent Countries. 2 vols. London, 1822.

Prasad, I. A History of Muslim Rule in India. Allahabad : Indian Press. 3rd edition, 1933.

Rennell, J. Memoirs of a Map of Hindustan. London. 3rd edition, 1793.

——. Bengal Atlas. 8 Parts. 1st edition, 1779.

Revenue Survey Atlas. Lower and N.W. Provinces. Scale : 4 miles to one inch. Allahabad.

Senex. New Map of India and China from Latest Observations. Ca. 1720.

*Settlement Reports.* Districts : Ballia (1882-1885) ; Banda (1881) ; Bharaich (1865-1872) ; Gonda (1878) ; Mirzapur (1887).

Sewell, R. A Forgotten Empire. London, 1900.

Smith, V. A. Early History of India, including Alexander's Campaigns. Oxford : Clarendon Press. 4th edition, 1924.

——. Akbar the Great Mughul. Oxford : Clarendon Press, 1917.

Wadia, D. N. Geology of India. London : Macmillan and Co. Ltd., 1939. p. 285 *ff.*

——. River Changes in the Latest Geological Epoch. *Proceedings of the 28th Indian Science Congress*, 1938, Part 4, p. 878 *ff.*

# SOME SCOTTISH RIVER CAPTURES RE-EXAMINED

By David L. Linton

No one who takes a good physical map of the Grampian Highlands and examines critically the upper courses of the Rivers Dee and Don and their relations to the near-by tributaries of the Spey and Garry, can fail to be struck by a number of anomalous features which have all the appearance of being elbows of capture. In the neighbourhood of the headwaters of the Dee the eastward-flowing upper Feshie bends drastically through nearly two right-angles to flow first westwards and then northwards to the Spey, and the similarly eastward-flowing Tarf Water bends even more sharply through 130° to flow south-westward to the Garry. Again, at the very source of the River Don as it is to-day the upper Avon turns sharply through 100° away from a course which would carry it straight down Strathdon, to a northward course down Strath Avon to join the Spey. These striking features have attracted attention for half a century, and the pages of this *Magazine* have in fact carried a not inconsiderable series of papers (1901, 1915, 1919 and 1944) dealing with the first two of them. They have moreover received further consideration elsewhere, and this persistence of discussion over so long a period is noteworthy. The fact is that although all three elbows have been attributed to the operation of the normal process of river capture by adjustment to structure, they each exhibit some feature or other which renders such an explanation doubtful. Even the published accounts by the late Dr. Alexander Bremner, who gave much thought to this group of problems and was almost alone in studying them in the field, savour in places of special pleading, and the discerning reader cannot help surmising that some important element in the discussion has been missed. Recent re-examination of the three occurrences in the field leaves no room for doubt in the matter. In all three cases the operative factor appears to have been a process not envisaged by the earlier workers—or not envisaged as having application to the matters in hand—namely, the breaching of watersheds by ice.

This process results when the ice accumulating in an upland basin is inadequately discharged by the pre-existing valley outlets and overtops the divides into neighbouring drainage basins. The ice-flow thus set up across the divides is termed *diffluence* or *transfluence* according to circumstances, and can lead to powerful and localised erosion along its path and the production of a deep ice-worn trough transecting the watershed. These processes have long been familiar to Alpine glaciologists. Diffluence and transfluence were named by Albrecht Penck [1] before 1909, and their morphological results were systematically set out by W. M. Davis by 1912.[2] But workers in this country do not appear to have realised that they had operated in British mountains, and our understanding of several important features of our mountain scenery has been seriously handicapped in consequence. About ten years ago the writer's field work drew him to conclude that some of the deep breaches across major watersheds in the Scottish

Highlands—of which the Pass of Drumochter may serve as an example—had had no significant pre-glacial counterparts but had been substantially opened up and enlarged to their present dimensions by the ice itself. Subsequent reading revealed that such views, however unusual in Britain, were by no means new, and later field work showed that not only were the views of Continental and American writers fully applicable to Scottish instances, but that they threw much light on problems of a different kind and in particular on that group of apparent river captures which we have just mentioned as having long engaged attention without, however, being satisfactorily solved. For it will need no emphasis that if a new and deep breach is opened through a previously existing watershed, there is a distinct possibility that in the post-glacial re-establishment of the drainage system a river may find a lower course through such a breach than by the route which it formerly followed. Diversion will have been achieved, but river capture—in the sense of the piecemeal encroachment of the territory of one river advantaged by favourable relations to geological structure or to base-level upon the territory drained by another—will not be involved. In what follows it will be urged that these are precisely the circumstances that have led to the diversion of the Feshie, the Tilt, and the Avon.

Before proceeding to take up these three cases in turn, however, it may be well to indicate the chief morphological features that are associated with, or result from, the glacial overrunning and erosion of a pre-glacial pass. Figs. 1 and 2 illustrate the chief points involved: they are re-drawn with some modifications from Davis's original diagrams [3] and are taken from a fuller discussion of glacially-breached watersheds which the writer has recently presented elsewhere.[4] In these diagrams, P marks the pre-glacial position of the pass which is lowered by ice-erosion and displaced 'upstream' to Q. This change is accompanied by replacement of the smooth harmonious curves of the pre-glacial saddle by the harsh forms and discordant outline of a glacial trough. The trough walls may be rough-hewn by plucking, or ground smooth and 'boiler-plated' if the pass was used for a sufficiently long period. In either case they show a marked break of slope against the smooth forms above and rise to a culmination along the pre-glacial divide PRS—often a conspicuous and valuable diagnostic feature. The trough itself is opened up to U-form, may exhibit some moutonnée features on its floor and lower slopes, and in suitable circumstances a rock-basin lake may be developed. It will be noted that the lateral streams X and Y tributary to the original main valley now make upstream junctions or, as Griffith Taylor would say, 'boathook bends,' and all the streams of the unglaciated or unmodified portion of the upland now find themselves out of relation to base-level and are busily regrading their lower courses by active downcutting and gullying. In the three Scottish instances which we now take up all these criteria are present and recognisable, and we have in fact to deal with cases in which the point Q has been lowered below the level of the upstream reach of the original valley and river diversion by glacial watershed-breaching has occurred.

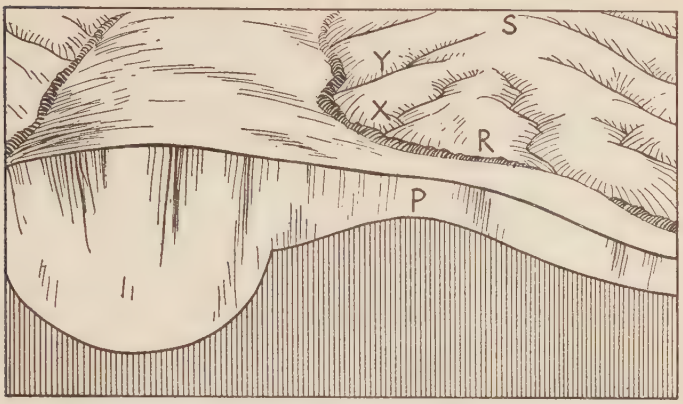


Fig. 1. Glacial diffluence over a pre-glacial pass (P).
Other symbols explained in text.

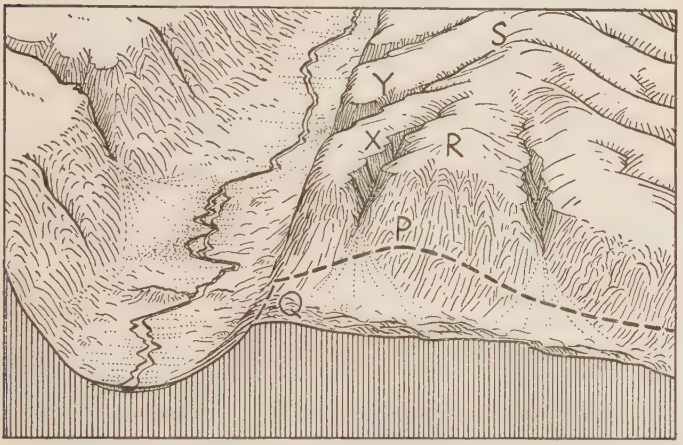


Fig. 2. Pass lowered by glacial diffluence.

## I. The Diversion of the Upper Geldie

The significance of the striking elbow in the course of the River Feshie where it approaches the Inverness-Aberdeenshire boundary was first noted by L. W. Hinxman.[5] He was impressed by the misfit character of the Geldie Burn, which occupies the valley leading eastward from the elbow, by the fact that the watershed is only a few feet above the present level of the Feshie, and by the presence of a drift filling in the Geldie valley eastward of the elbow, and, without attempting any explanation of the mechanism of the capture, assumed it to be " evident that the Feshie, cutting back through an earlier watershed, has captured the upper portion of the Geldie " and that the capture " took place during post-glacial times."

This view of the matter was adopted by Peach and Horne [6] in 1910

and by Bremner [7] in 1912, but an examination of the ground led the latter to modify his views by 1915 and to express " doubt whether it be so recent as Mr. Hinxman holds." [8] The virtual absence of any incision by the Feshie below the watershed to the east of it appears to imply a very recent date for the diversion, but Bremner argued against this view that (i) no abandoned stream track can be traced immediately to the east of the elbow, (ii) there is no evidence of a greater volume of water having recently passed down the upper Geldie than now does so, and (iii) the gradients of the existing upper Feshie do not pass in any normal manner over the present watershed or down the valley of the Geldie. To explain the existing conditions he found it necessary to postulate (*a*) that in pre-glacial times a westward-flowing tributary of the lower Feshie effected notable headward enlargement of its basin—though he does not suggest any geological circumstances that would favour such activity—and tapped successively all south-flowing streams from Creag na Caillich to the River Eidart (Fig. 3) and ultimately the upper Geldie ; (*b*) that glacial erosion then supervened obliterating those features—namely, incision of the diverting stream below and of the diverted stream above the elbow of capture—which might be looked for if the captures noted in (*a*) had occurred ; (*c*) that in late-glacial times a barrier of " morainic deposits " had barred the course of the upper Feshie at the present elbow, and that " while the present upper Geldie valley was occupied by glacier ice, an overflow of melt water was directed across, and cut a channel in, the morainic deposits between the elbow and the mouth of the Eidart."

The very complexity of this explanation makes it far from convincing, and its first postulate is founded in weakness. Not only is there no apparent structural feature of which the supposed diverting stream could take advantage, but the present Feshie between the Eidart confluence and Creag na Caillich flows transversely over the resistant Moine gneisses in which, for some time to come, it will have a tough time establishing a graded course. Nevertheless, Bremner saw no occasion to modify his hypothesis in discussing the former westward extent of the Dee drainage in 1919, or when he last returned to the subject in 1944.[9]

In the re-evaluation of the problem which follows attention will be successively directed to three points : (i) the evidence for the former westward extension of the Geldie drainage ; (ii) the local circumstances attending the diversion of the upper Geldie at the actual elbow ; and (iii) the origin of the breach in the Geldie-Feshie (Dee-Spey) watershed which made the diversion possible.

(i) The valley of the Geldie Burn is a broadly open mature valley whose drift-encumbered floor is virtually all above 1500 feet, lying between the main Grampian watershed on the south and the south-western portion of the Cairngorm plateau on the north. Inspection shows its form to be polycyclic. The spurs that run towards the Geldie from the higher ground on both sides, though slightly roughened by ice in two cases and somewhat obscured by drift in others, all show a marked flattening at about the 2000-foot level (Fig. 3). Collectively they define a once continuous but now dissected valley-floor, which

may be traced westwards at diminishing heights above the present stream till, on passing across the county boundary, it can be seen to pass continuously into the actual floor of the uppermost part of the present Feshie valley. Not only this, but on the northern or Cairngorm side the bench can also be traced westwards across the county boundary

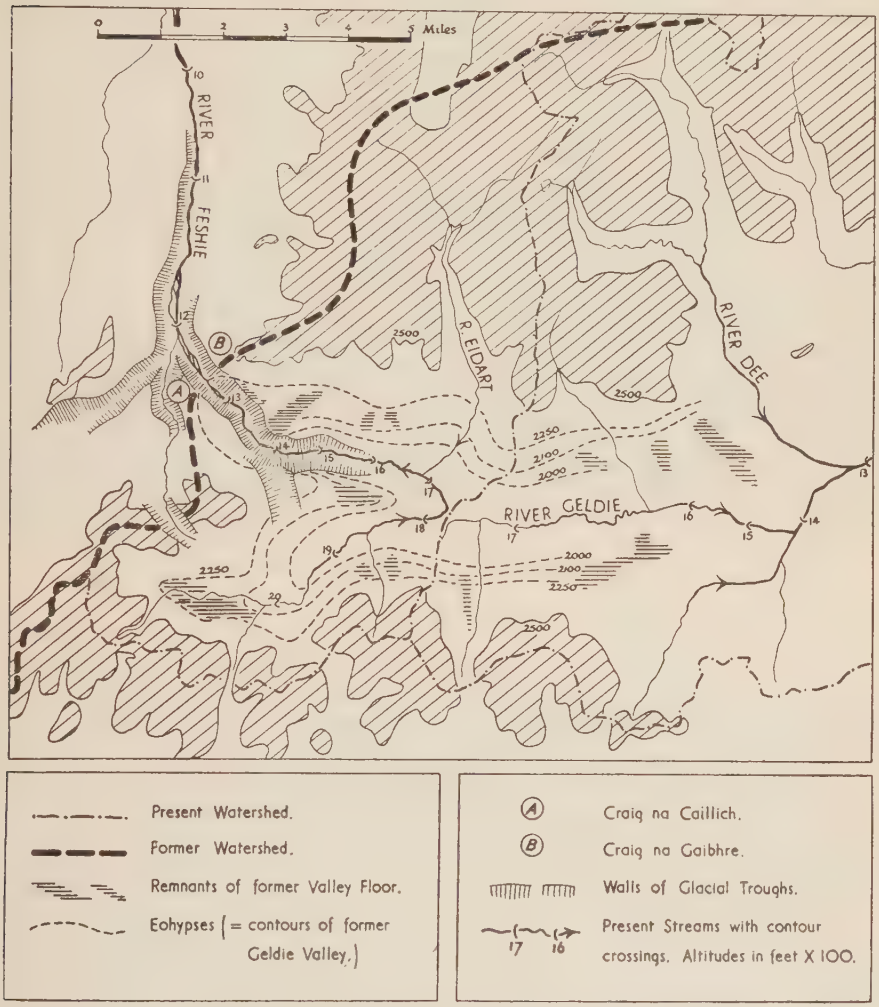


Fig. 3. The upper Feshie and Geldie valleys.

where it becomes a conspicuous feature overlooking the trough of Glen Feshie. West of the Eidart this bench feature is relatively little dissected and rises to 2100 and 2150 feet. But the Cairngorm slopes and the north wall of Glen Feshie converge westwards and at Creag na Gaibhre the last Cairngorm ridge, the Druim nam Bò, meets the glen transversely and the bench is extinguished. On the opposite side of Glen Feshie only 800 yards away at Creag na Caillich a similar but

smaller remnant of the bench is pinched out between the glen wall below and higher ground above. Appearances leave no doubt that here was a former watershed between the Feshie flowing northwards from the further side and the Geldie drainage descending eastwards along the flattish floor now represented by the bench remnants. The situation is well shown by the generalised contours of Fig. 3, and in particular that of 2250 feet, and by the impressive view from the summit of Sròn na Bàn-righ illustrated in Fig. 4.

We thus appear to have good grounds for accepting the assumption earlier made by both Hinxman and Bremner, that it was along the line of Creag na Caillich and the Druim nam Bò that the western watershed of the Geldie basin lay at some time in the past and from which it has leapt some six miles to its present position as the result of the diversion. But it is not necessary to assume with Bremner that the watershed has shifted pre-glacially, nor with Hinxman that it remained unmoved till post-glacial time. The direct evidence of the eastward-falling bench shows that the location of the watershed remained unchanged till after the rejuvenation that opened out the present Geldie valley had taken place. The scant incision of the most westerly burns that cross the bench suggests that this rejuvenation had made only small progress when the glacial episode supervened. Pre-glacial migration of the divide is thus improbable. On the other hand, the facts adduced by Bremner to prove that there has been no post-glacial connection between the upper Feshie and the Geldie also show clearly that when the ice passed away the Craig na Caillich ridge was a watershed no more.

(ii) The detailed morphological features at the supposed "elbow of capture" are such as to make clear that this is a case, as Bremner held, of diversion and not capture. The upper Feshie at the elbow has a steeper gradient than is found in either its own higher reaches or in the flat, drift-floored Geldie trough. When it enters the latter, therefore, at its western end it has thrown down a considerable alluvial cone. The building of this cone implies that at no distant date Feshie water spilt down each and all of its radii and thus into the Geldie valley as well as toward the lower Feshie. But for some time now it has been fixed in the latter course and has dissected the western portion of the fan, leaving a series of minor terrace features on the slip-off slope on its left bank and exposing 6-8 feet of coarse river deposit with well-rounded boulders [10] in the concave bluff that is being actively undercut as the river swings round the bend. Beyond this low bluff the undissected eastern portion of the fan has accumulated some six or more feet of peat whose convexity now forms the 'divide' followed by the county boundary.

Clearly we are here dealing with what E. B. Bailey has called a *corrom* watershed. The upper Feshie has built a fan on the floor of a trough that, at the time the fan was laid down, must already have had two outlets, one by the Geldie and one by the lower Feshie ; sooner or later the water was bound to discover the outlet with the steeper fall and become fixed there. Yet, since the difference in gradient is by no means marked until the Feshie is joined by the swiftly-flowing Eidart

WATERSHED BETWEEN SPEY AND DEE
FOREGROUND: EIDART—BACKGROUND: MEALL TIONAIL AND CÀRN AN FHIDHLEIR

UPPER GLEN FESHIE—CREAG NA CAILLICH AND CREAG NA GAIBHRE

UPPER GLEN FESHIE

GLEN FESHIE:
SRÒN NA BÀN-RIGH
STALKERS' BRIDGE

Fig. 4. The Glen Feshie breach from Srôn na Bàn-righ.

three-quarters of a mile below the 'elbow,' the present situation has in it elements of impermanence. Lateral corrasion is actively in progress at the bend and could conceivably gnaw eastwards through the fan and return the upper Feshie for a short time to the Geldie ; but in time the steepening of gradient which is noticeable on the Feshie to-day below the Eidart confluence would work back upstream to the 'elbow' and render the diversion permanent.

(iii) If the Feshie be followed downstream from the Eidart confluence it will be observed that its valley changes form progressively. At the eastern end of this section three morphological elements are present : (*a*) the old high-level bench at 2100 feet below the Cairngorm slopes on the north and represented on the south side of the valley by the marked flattening at the eastern end of Sròn na Bàn-righ ; (*b*) slopes of moderate steepness passing laterally into those that form the sides of the V-shaped lower Eidart valley, and may be presumed to be roughly the valley slopes that resulted from the pre-glacial rejuvenation of the Geldie and its tributaries ; (*c*) an irregular rock-walled valley within and below (*b*), partly masked at the eastern end by striking kame-terraces but becoming more conspicuous westwards with the stream traversing rock ledges in deep-cut pot-holed notches. Continuing in this direction this last element (*c*) grows in magnitude and importance. The rock walls rise and encroach on (*b*) and the floor becomes ampler till at Creag Bheag the feature assumes the character of a true glacial trough with a braided stream swinging on its aggraded floor and receiving its lateral tributaries through striking hanging slot-gorges. At Creag Bheag, moreover, element (*b*) in the valley form disappears, and the rock walls of the trough abut directly against the bench remnants (*a*), and the trough assumes proportions that may fairly be called majestic. But the climax is not yet. A mile further on the last remnants of the bench (*a*) die out, as already described, against the rising ground of the old watershed that ran from Creag na Caillich by Creag na Gaibhre to the Druim nam Bò. Simultaneously the trough narrows to 750 yards at the 2000 foot level, its flat floor widens to 300 yards and its walls steepen and achieve their maximum height of 1050 feet ; immediately beyond it bursts into a valley of entirely different form and aspect, with a flat floor nearly half a mile wide, and open flaring valley slopes that are already a mile and a quarter apart at the 2000 foot level. Here then is the ice-worn breach in the old watershed (cf. PRS in Fig. 2), and the view of it from the top of Sròn na Bàn-righ is worth a weary walk to see (Fig. 4).

Projection of the bounding valley slopes from Creag na Caillich and Creag na Gaibhre outward to the mid-valley line allows one to conclude that there was formerly a col at this point whose level may be put at 2200 feet (cf. P in Fig. 1). It was across this col that ice began to pass when the whole of the basin of the former Geldie had filled with ice to this or a higher level. No true corries open into this basin, but both its Cairngorm and Grampian slopes doubtless nourished névé fields [11] which slowly filled the basin with ice. The natural outlet for that ice would be eastwards down the Geldie valley, but in this direction its progress was no doubt effectively barred by the entrance at White

Bridge of the most powerfully nourished and most active of all the Cairngorm ice-streams, that of Glen Dee. The Geldie basin was thus what the writer has elsewhere called "a basin of impeded outflow," [12] and the conditions favoured glacial transfluence. This occurred across the col at the western end into Glen Feshie which was either ice free or —more likely—filled by ice only to a much lower level. Flow began when the ice level in the Geldie basin had risen not merely to 2200 feet but to such height above that level as would provide the energy necessary to drive an ice tongue downhill to the col. Once flow was started, modification of the col to suit its new function began also, and as this process took effect, the col became an increasingly efficient outlet and received an increasing ice-flow. The col was lowered, and the old valley floor which led to it was lowered also and reversed in gradient, till, when the ice finally wasted away, the floor of the great breach in the watershed was already 900 feet lower than the pre-glacial col and 500 feet lower than the Feshie at its elbow. Whether this 900 feet of downcutting at the col was achieved wholly in the last glaciation or was the summation of the work of the ice of several glacial phases the writer at present sees no criterion to determine. The point, however, is immaterial to our present purpose. Whatever the condition may have been during the interglacial phases, when post-glacial time came, the lowest path open to waters descending what had pre-glacially been the upper valley of the Geldie was through the Creag na Caillich breach into Glen Feshie, and after a period of divided allegiance when the waters spread over the growing alluvial cone at the present elbow into both the old and the new valleys, the swifter fall by the new path permitted a slight incision into the deposits of the cone and diversion of the upper Geldie was effected.

The writer wishes to acknowledge gratefully assistance from the Research Fund of the University of Sheffield in connection with field work carried out in 1948.

[1] Penck, A. "Glacial Features in the Surface of the Alps." *Journal of Geology*, 1905, 13 : 1-19.
—— and Brückner, E. *Die Alpen im Eiszeitalter*, p. 281. Leipzig, 1909.

[2] Davis, W. M. *Die erklärende Beschreibung der Landformen*, pp. 424-425 and 445-447. Leipzig, 1912.

[3] Davis, W. M. *Op. cit.*, Figs. 158 and 159.

[4] Linton, D. L. "Watershed Breaching by Ice in Scotland." *Transactions of the Institute of British Geographers*, 1949 (at press).

[5] Hinxman, L. W. "The River Spey." *S.G.M.*, 1901, 17 (*4*) : 185-193.
——. "The Geology of Upper Strathspey, Gaick and the Forest of Atholl (explanation of Sheet 64)." *Memoirs of the Geological Survey, Scotland*, 1913, pp. 7-8.

[6] Peach, B. N. and Horne, J. "The Scottish Lochs in Relation to the Geological Features of the Country." *A Bathymetrical Survey of the Fresh-Water Lochs of Scotland*, 1 : 439-513. Edinburgh : Challenger Office, 1910.

[7] Bremner, A. "The Physical Geology of the Dee Valley." *University Studies* [Aberdeen], 1912, No. 56, p. 12.

[8] Bremner, A. "The Capture of the Geldie by the Feshie." *S.G.M.*, 1915, 31 (*11*) : 589-596.

[9] Bremner, A. "A Geographical Study of the High Plateau of the South-Eastern Highlands." *S.G.M.*, 1919, 35 (*9*) : 331-351.
——. "The Later History of the Tilt and Geldie Drainage." *S.G.M.*, 1943, 59 (*3*) : 92-27.

[10] Bremner calls the cone "a platform . . . composed of loose materials" (*op. cit.*, 1915, p. 590), and later speaks of it as part of a "great accumulation of moraine." He observes in a footnote that the officers of the Geological Survey contributing to the Memoir on Sheet 74 variously describe it : it is called "drift" by Hinxman, "alluvium" by Barrow, and "alluvium" by Cunningham-Craig in a paragraph on fluvio-glacial sands and gravels. The writer finds it distinct in form from the morainic accumulations on the adjacent slopes and, where exposed in the stream bank, comprised of water-borne detritus.

[11] At the present day these slopes are shown in the *Rainfall Atlas of the British Isles* (Royal Meteorological Society, 1926, Plate 1) as receiving more than 60 inches average precipitation a year and are figured as the wettest part of either of these ranges.

[12] Linton, D. L. *Op. cit.*, 1949.

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# HISTORY OF THE SCOTTISH FORESTS

By F. Fraser Darling

This is a melancholy history. Scotland lost one forest several thousand years ago when the climate turned wetter and cooler. Sphagnum moss grew so luxuriantly that it felled the forest as surely as axe or fire. The second forest of pine, oak, birch, hazel, holly and alder which covered the greater part of Scotland was destroyed by man, a process which is only now at its finishing point.

The Hallstatt Celts were probably the first considerable human destroyers of the Caledonian Forest. Wherever they have been traced, forest destruction has been identified with them. Their effects would be most marked on the eastern side of the country and through the Central Plain. They probably never touched the West. The Romans would doubtless deforest a considerable area within view of the Walls of Hadrian and Antoninus—a military measure seen in our day along the Russo-Polish frontier before the Second German War. Again, the main great forest of North and West would be untouched, and we know that much old forest survived in the Southern Uplands.

The Northumbrian Saxons as a forest edge people doubtless continued destruction in the Tweed Valley and the Lothians, and they were probably the instrumental agents in cutting the great forest in two between Forth and Clyde. The northern part remained pretty well inviolate for some hundreds of years.

The Vikings were the great destroyers from the ninth to eleventh centuries. They used fire as a military offensive weapon, setting light to the forest as a means of clearing the inhabitants. The harriers of the west coast were aided by the prevailing winds from the sea. When conditions allowed, the natives used a forest fire as a defensive measure against the Vikings, but for the forest the result was equally depressing.

The Highlands at this time were also being looked upon as a

valuable source of timber by the Vikings. Their northern empire of Orkney, Shetland, Iceland, and the Hebrides called for much ship-building, and it is believed that there was a substantial timber trade. Several hundred years before, in A.D. 207, the Roman Emperor Severus had come to the Caledonian Forest for timber.

The great forest was the wealth of the Highlands, and our regret is that the succeeding generations of men could not consider the forest as such to be conserved rather than exploited. Inveraray on Loch Fyne, Inverlochy at the head of Loch Linnhe, and Inverness—these were the great centres of commerce of the old Highlands, for timber and products from forest regions as, for instance, furs and salmon. A large French ship of war was built at Inverness in 1249 from the local timber. Ardgour exported timber as late as the seventeenth century. Timber needs alone might not have left us with the devastated country we have to-day, but there were more insidious factors of destruction. The forests of the Southern Uplands were, for all practical purposes, cleared in the fifteenth century when these hills became the sheep walks they have been ever since. The geology of this region, Silurian and Old Red Sandstone, is such that this land use has been maintained until now, but there are signs of rot. Few hilly areas are good enough to withstand 500 years of extensive, extractive sheep-grazing without deteriorating.

The sixteenth century produced a crop of edicts, orders, and prohibitions to preserve what was left of the Lowland forests, but they did little good : Scotland was by then a bare country wherever there were many people, so that in 1617 the Englishman Sir Anthony Weldon could irritate the Scots by his joke that Judas could not have found a tree in Scotland whereon to hang himself. The other famous timber joke about Scotland came over 150 years later when Dr. Johnson lost his walking stick.

Nevertheless, the English have been the greatest agents of destruction in Scottish forests. The blessing of the Union of the crowns was not appreciated by all Scots, and many such non-co-operators betook themselves to the shelter of the great forests of the north. General George Monk in 1654 gave orders for the burning of an immense area of forest round Aberfoyle to rid the place of " rebels and mossers." Wolves were another reason for burning forests, especially in Rannoch, Atholl, Lochaber and Breadalbane.

This is the period when the great forest of the North was " discovered " by the southern iron smelters who had caused the devastation of so many southern English woodlands. Furnaces or bloomeries were established far up the West Highland sea lochs, and the forests of oak and pine were felled for charcoal and for heating the furnaces where the sea-borne iron ore was smelted. The names persist to-day, Gaelicised. This usage of forest was far more extravagant than for timber and, of course, in a growing country increasingly using iron, the forest is quite unable to regenerate the loss.

Finally, we come to the greatest attack of all, in the eighteenth century. The Risings of '15 and '45 had been put down and the power of the chieftains of the clans broken. It was now safe for business

capital to be invested in the Highlands, and there was plenty ready to buy the standing forests of the Spey Valley region. The York Building Company worked in a big way, devastating large areas quite remorselessly, and many accidental fires attended their period of felling. Fortunately, the Company failed before the Spey forests were quite denuded. Iron ore was now being brought well inland, and charcoal was going from the inland forests on the backs of ponies.

The great Forest of Caledonia was finished, but there still remained large tracts of pristine woodland east of the Cairngorms, in the Spey Valley itself and in the Inverness-shire Glens of Affric, Cannich, Glass and Strathfarrar. I would recommend to you the second and prose volume of *Lays of the Deer Forest*, by Charles Edward and John Sobieski Stuart, treating of the period of the early nineteenth century. As out-and-out Jacobites in a world which no longer took them seriously, they became escapists in effect and lived a wonderful life of natural history in the remnants of the forests. They describe the forest of Darnaway in Moray, and the botanist will recognise the pristine quality of this woodland compared with the solid *Molinia* or *Vaccinium* under so many of the woods in the Highlands to-day. They say : " Few know what Tarnaway was in those days—almost untrodden except by the deer, the roe, the foxes and the pine-martens. Its green dells filled with lilies of the valley, its banks covered with wild hyacinths, primroses and pyrolas, and its deepest thickets clothed with every species of woodland luxuriance, in blossoms, grass, moss . . . growing in the magnificence and solitude of an aboriginal wilderness . . ." and again, " . . . the remains of the mighty aboriginal pines, the oaks which had no doubt seen the Raid of Harlaw, and the gigantic hollies, which in some parts covered the ' pots ' and braes, and were not exceeded, perhaps not equalled, in Great Britain." They speak of hollies six feet in circumference and how the heaviest snow did not penetrate to the foot of the trunks. We can forgive the hyperbole, recognising the beauty of the old forest with its associations of animals and plants. This too has passed away.

The eighteenth century fellings were followed by a quick grassing over ; the northern lairds needed hard cash to live the new life of the south now laid open to them. This money was forthcoming from the Southern Upland sheep farmers looking for new lands. The ' Coming of the Sheep ' to the Highlands is something of an epic, though not a very glorious one. It started north of the Firth of Clyde in 1760. Most of Argyll and Perthshire and parts of Inverness-shire were colonised by 1790. Caithness and parts of Sutherland were occupied by Cheviot sheep round the turn of the century, and Ross-shire came under sheep early in the nineteenth century. The brothers Stuart remark on twelve miles of pine woodland being burnt in Glen Strathfarrar " to improve the sheep grazing," in 1813. The high rents offered by the sheep men caused the lairds to clear the glens of the common folk who were now increasing in numbers very fast by reason of delivering themselves as a hostage to the potato, and the vast quondam forest country of the Highlands went down to sheep, just as the Southern Uplands did three hundred years before.

Sheep farmers in the Highlands cashed in on the accumulated fertility of thousands of years, and their pastoralism was immensely profitable for a century. But the geology of the Highlands is entirely different from that of the Southern Uplands. Gneiss, Torridonian Sandstone, and a variety of metamorphosed gneisses and schists are no good foundation for an indefinite period of extractive pastoralism in a countryside of heavy rainfall. We are now down to the bare bones, as it were, and a decrepit Highland sheep husbandry is bolstered by a large subsidy which further degrades the land which once bore the forest. Before going on to the effects which sheep farming has had on the land of the Highlands, the wave of afforestation which began in the eighteenth century should be mentioned, for in a limited area it did help to offset the great losses.

The larch tree came to Dawyck, Peeblesshire, *c.* 1725 [see photograph], and to Dunkeld, Perthshire, in 1738. It was an historic introduction, for apart from the enthusiasm for planting larch, afforestation with Scots pine was also engendered. Successive Dukes of Atholl planted on their vast estate, the Spey Valley lairds such as Rothiemurchus and Abernethy also planted on a big scale, and later the Countess of Seafield planted over 40,000,000 trees. Eastwards, the Gordon Estates planted in the dry country of Moray, and westwards Sir John Ramsden on Lagganside, and great new forests rose on the Mackintosh Estates round Moy. To one who knows what the old forest was like with its shrub layer of juniper and rowan and the birches interspersed among the pine, who knows the joyfulness of this stable habitat, the new forests are but still, dark groves with no field layer such as the Stuarts have described and from whom I have quoted. However, it is little wonder that looking around him at the eighteenth and nineteenth century planting, Harvie-Brown should write in 1895, "... many thousands of acres of the older growths have been scientifically conserved, and are now engaged as of old, in self-regeneration, and there seems little fear at the present day, that any repetition of the old wastefulness of our forests will be permitted."

Harvie-Brown, whose work I have freely drawn upon in this paper, died before the First German War. He never knew what happened then and how we in the 'twenties, gasping as it were and saying the damage to the remains of the old forest and the shearing of the new ones must never happen again like that, would have to gaze upon the ruins in the Highlands of forests felled in the Second German War. Our land is so devastated that we might as well have been the battlefield. See the very windbreaks taken from the roadsides, see the wreck of Glenfeshie, the Rothiemurchus that is no more, the shearing of the Sutherland woods, the removal of shelter from the wind-ridden West and the immense landslips on the road from Tomdoun to Loch Hourn. That is what deforestation has meant in our time. And if the proceeds of the first forest went into the lairds' pockets, not so with these wartime fellings. Proprietors are left without the wherewithal to rehabilitate their estates. The State is slow to get on with the job and we continue to look at the debris year after year.

But I do not wish to appear to criticise unduly. The Forestry

Commission is constantly working under difficult conditions of shortage of labour and of plants, criticised by pastoralists, by economists who deal in counters rather than nature, and by the vocal few who think that bare, barren moor is what nature made it. If we desire prosperity in the North, we should make a large part of Highland and Southern-Upland Scotland into a forest country, a regenerating sylvan continuum which will be an abiding wealth. The odds are against us : what has taken a thousand years and more to destroy cannot be put back in a century, the insatiable demand for timber continues and even a short hundred years seems too long to think ahead nowadays.

There are still a few patches of the old pines left and which we should immediately make into National Nature Reserves, fence, and set about by management to re-create the shrub and field layer of the old forest. This is a matter of crucial urgency, but the Nature Conservancy will have some difficulty in acquiring and managing any of these areas. There are also a few stretches of the old oak woods still left, most valuable remnants and harder to conserve than the pines. One of these relict areas which I know well is under State ownership, yet year by year it is being whittled away for local fuel needs, and all regeneration is prevented by uncontrolled sheep grazing. Repeated entreaties to care for this valuable relic go unheeded, and I am very doubtful indeed whether these unique 500 acres will ever be fenced against sheep, have the rabbits kept down, and be allowed to develop once more the shrub layer of hazel, rowan, and holly, which still persists in an attenuated state.

I want to conclude with a few words on what happens to the terrain when forest growth is cleared and is followed by sheep farming for a century or more. Regeneration is, of course, prevented and tree growth is confined to the steep paths of water courses and small escarpments which the animals cannot reach. The texture of the soil alters—I use soil as a general term, fully realising that it is euphemistic for much of what covers Scottish hillsides. Such finer particles of true soil as do exist are soon washed out by mechanical action in a country of such high rainfall. Areas of drift soon begin to gash and create silting problems in the valleys below. The Tay Basin as a whole is an excellent object lesson. The removal of the trees means that the remaining and colonising herbage does not root as deep as the trees and the circulation of such basic material as exists is checked. Leaf fall deposits such basic compounds, and even more, the consumption of a proportion of the young foliage by such caterpillars as those of the mottled umber and winter moths deposits calcium-rich organic pellets, charged with cellulose-splitting organisms, on to the ground. These are seized upon by earthworms and other macrofauna of the soil, and if earthworms are present, a good deal of mechanical circulation of litter and soil goes on, creating a friable layer which, even on a poor Highland hillside, approaches the nature of a brown forest soil—*mull* rather than *mor*. Such a soil vertically drains the heavy rainfall which has been broken in force by the canopy. Removal of the trees checks this cycle entirely : the basic compounds do not reach the surface, the earthworms consequently disappear, because the calcium level is critical for these

RHIDORROCH, ROSS: THE MOST NORTHERLY LIVING REMNANT OF THE CALEDONIAN FOREST

WEST GLEN CANNICH: PLEISTOCENE AND PEAT DEPOSITS
REMAINS OF SCOTS PINE EXPOSED AT 1800 FEET LEVEL

DAWYCK, PEEBLESSHIRE: ONE OF THE FIRST LARCH TREES PLANTED IN SCOTLAND, c. 1725

GLEN MORE, INVERNESS-SHIRE: OLD SCOTS PINE LEFT AFTER 1914-1918 FELLINGS
BACKGROUND: CAIRN LOCHAIN (3984 Ft.)

BLACK WOOD, RANNOCH: NATURAL FOREST OF SCOTS PINE
TREES OF DIFFERENT AGE AND FORM

THE MOORS OF FESHIE: LAND PREPARED FOR AFFORESTATION

animals, there is no circulation in the soil and the peaty profile hardens, toughens and condenses. The drainage becomes increasingly lateral and the carbonic-acid charged water makes sourer still the herbage surfaces lower down. Run-off is swift and rivers are ruined as fish nurseries.

Sheep farming comes to mean a very wide and, in fact, unbalanced sheep-cattle ratio, sometimes as wide as 75 to 1. This imbalance means a highly selective grazing of the herbage and a large amount of rough stuff uneaten at the end of the season. Fire is the only means of getting rid of it, and after a number of burnings the herbage floor is markedly impoverished, the drier ground going to bracken, the wetter becoming almost pure *Molinia*, or degrading to a limited sward of *Scirpus caespitosus*, dwarf *Nardus* and *Erica tetralix*. The 'soil' has become a tough, inhospitable, and intractable peat. Vast areas of the Highlands have reached this level of dereliction. Sheep farming continues, thanks to the subsidy, but it is not truly economic, and when such land falls to the Forestry Commission, that body should receive all sympathy. To get tree growth back on to that ground and for it to creep into higher contours may mean years of ecological management by way of scrub of the meanest kind. Scrub is to be valued wherever it exists, not despised.

I would suggest that the history of Scottish forests should show us the poverty we now suffer, the need for taking care of the remnants of wild forest left to us, and move us towards a fuller and more humane afforestation policy. It would seem imperative that the tree-planting body should also be the tree-felling body, and that existing knowledge and further research should be brought to bear to make Scotland's new forest a continuum and an ecological whole.

Paper read at a Symposium on Forests held at the Annual Meeting of the British Association for the Advancement of Science, 1949.

The photographs illustrating this paper are by Mr. Robert M. Adam.

Harvie-Brown, J. A. Vertebrate Fauna of Scotland. Vol. I. Edinburgh, 1895.

Ritchie, James. The Influence of Man on Animal Life in Scotland. Cambridge : University Press, 1919.

Stuart, J. S. and C. E. Lays of thé Deer Forest. Edinburgh, 1848.

Watt, H. B. Scottish Forests and Woodlands in Early Historic Times. *Annals of the Andersonian Naturalists' Society*, 1900.

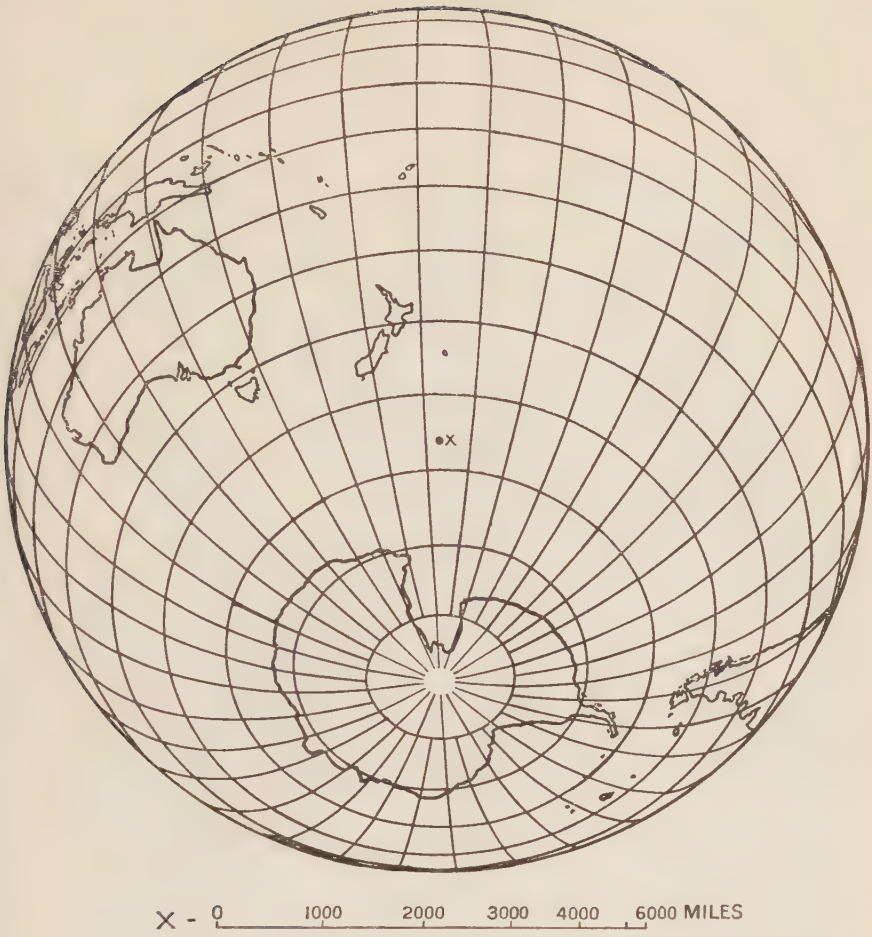
The Edinburgh hemisphere.

## ORTHOGRAPHIC HEMISPHERES CENTRED ON EDINBURGH AND ITS ANTIPODE

In a recent article [1] attention was called to the now rather neglected orthographic projection and particularly to its oblique application. It is a very simple projection, being in effect a view of the globe from infinity, but with modern developments what they are, it is more than ever necessary to stand well back from world problems and try to see our globe in its entirety.

Construction is simple : the normal cases are quite straightforward, but the obliques shown above are a little more involved. On the other hand, they yield readily to R. E. Harrison's [2] nomograph method.

While its main virtue is its ' bird's-eye-view ' effect, this projection has other valuable properties : it shares with other azimuthal projections the quality of having correct directions outwards from the centre : all straight lines from Edinburgh—or X—to other points in the hemisphere are the shortest routes, and the angle they make with the meridian at the centre gives their great-circle bearing. The lengths of these routes can be read off from the scale-line given below the hemispheres. On no projection can scale be correct everywhere, and the scale-line given above applies only to straight lines out from the centre. Scale, however, is true on the circumference and on all other circles drawn with Edinburgh—or X—as centre. Another




The antipodal hemisphere.

scale-line could be drawn for these measurements, but the left-hand section of the scale given is virtually identical and, as only a short length would be taken to step round a circle with dividers, it will serve for all ordinary purposes.

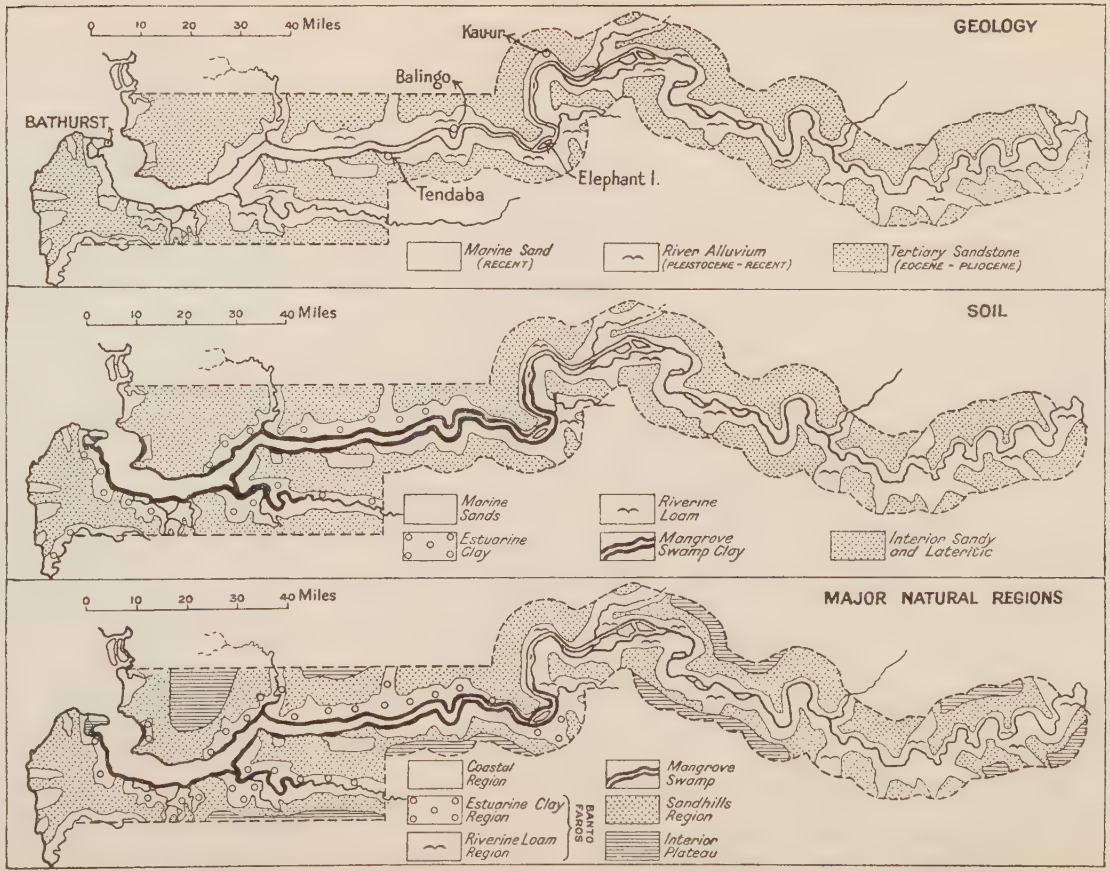
If it is desired to know *any* great-circle route, this is easily provided for. A normal equatorial orthographic graticule is drawn on tracing paper at the same scale as the obliques, and to find the great-circle route from, say, Moscow to Miami, it is necessary only to superimpose the tracing and rotate it till one of the meridians passes through the two towns in question. Its length, however, cannot be measured unless it happens to be on a line either radial or circumferential to E or to X.

Erwin Raisz,[3] commenting on the 'photographic' variant of this projection, says "its usefulness is . . . to give a realistic picture of what the earth would look like from a rocket ship. . . . This realistic view suggests realistic treatment—and this was badly needed to freshen our very conventional maps." A projection that brings us back to earth is not to be despised. RONALD MILLER.

[1] MILLER, RONALD. Map Projections of the Entire Sphere. *S.G.M.*, 1948, 64 (*3*) : 113-122.

[2] HARRISON, R. E. Nomographs in Map-making. *Geographical Review*, 1943, 655.

[3] RAISZ, ERWIN. Map Projections and the Global War. *The Teaching Scientist*, 1946, 2 (*2*) : 33-39.




The Gambia. Fig. 1. Geology. Fig. 2. Soils. Fig. 3. Major natural Regions.

# MAJOR NATURAL REGIONS OF THE GAMBIA

By H. Reginald Jarrett

The very elongated shape of the Gambia, that oddly-shaped corner of the British Commonwealth, of which it has been said that "its very appearance on the map is an invitation to the zealous reformer," makes it an extremely awkward country to divide into natural regions. This Colony forms an outstanding example of a political unit created quite without regard to geographical controls.

The River Gambia, together with the Colony and Protectorate of the same name, is situated off the West African coast in what is broadly termed the 'Soudan' belt of tropical summer rains. More exactly, the river debouches into the Atlantic Ocean in latitude 13° 30′ N [1] and longitude 16° 40′ W, while the Protectorate extends eastwards, like a finger pointing into the interior of the African Continent, along the river for almost 300 miles, or rather more than 200 miles in a straight line into longitude 14° 15′ W: "... the country can be likened to an elongated narrow insertion into the immensity of French West Africa—in effect an important riverine corridor occurring between latitudes 13° and 14° North." [2]

The dominating feature of the Gambia is the river of the same name together with its accompanying riverine lands. The river has cut out for itself a long, rather narrow, valley in the Tertiary sandstone of what might be called the 'Senegambian Tertiary Plateau.' In a general way, then, within the Colony itself there is the River Gambia together with the river flats through which it flows, flanked by sandstone bluffs leading up to the somewhat higher Tertiary plateau. Most of this plateau is in French territory, but extensions penetrate across the international border. The boundary between the river flats and the plateau is not clear-cut. There is a transitional zone: an area of low, undulating sandhills, separated by broad, shallow valleys, and derived from the sandstone plateau, the product of subaerial erosion. This transitional zone is the one to which the designation 'Sandhills Region' has been given below.

Since a knowledge of the underlying geology is of supreme importance before attempting to delimit the major natural regions, the main geological features are indicated in Fig. 1.[3] The major soil types, which are strongly influenced by underlying geology, are tentatively delimited in Fig. 2.

Fig. 3, in which is suggested a scheme of division of the Colony into its major natural regions, has been based partly upon the details of geology and soils referred to above, and partly upon first-hand experience. It need hardly be said that, as a pioneer attempt, it is entirely tentative.

The natural regions recognised are as follows:—1. The Coastal Region. 2a. The Estuarine Clay Region. 2b. The Riverine Loam Region. 3. The Mangrove Swamps. 4a. The Sandhills Region. 4b. The Interior Plateau Region.

According to Cooper,[4] the river flats (regions 2a and 2b) occupy about 24% of the surface area of the Colony, the Sandhills region 41%, and the interior plateau 27%. The remaining 8% are accounted for by the swamps, and the area covered by the main river and its tributaries. In this scheme no allowance is made for a coastal region such as is suggested here.

1. *The Coastal Region.*—The outstanding features of this region are its low elevation, a general, rather monotonous, flatness, marine sands, and the ubiquitous palm tree. The low elevation and flatness arise because the region is developed on unconsolidated marine and blown sands, low sand dunes being typical. The sand is often of no great depth, and rests on the tertiary sandstone beneath at an average depth of about ten feet. St. Mary's Island, separated by Oyster Creek from the mainland, and part of this area, is really a low sandbank, about 15 miles long, terminating eastwards in a typical hooked sandspit upon which stands that part of Bathurst called Half Die.[5] The dune-swale arrangement characteristic of the whole area is repeated here.

The soil covering this area is, of course, sandy and very light. It is usually leached and is not very fertile.

The typical tree is the palm—indeed it seems at first sight as though there simply are no other kinds of tree at all. Economically useless fan palms fringe the beaches, while coconut palms grow on St. Mary's Island. The oil palm is most typical, however, although the heavy yields from this tree met with farther down the Coast, especially under plantation cultivation, are not obtained here. A few wild date palms also grow in and around Bathurst. The fruit of the wild date is smaller in size than the variety which is exported from the northern deserts. It is called ' sebu ' by the natives.

2a. *The Estuarine Clay Region.*—This region is developed on the heavier alluvium of the estuarine section of the river.[6] The term ' clay ' is here used in a comparative sense only. During the rains the lower parts are inundated by the salt water of the estuary, and this saline flooding renders much of the region useless for agriculture. The flats are swampy, little used, and form the habitat of much game and wild fowl. Settlement avoids them.[7] The river flats generally of this region, and of region 2b, are locally called ' banto faros,' [8] and the typical vegetation of the banto faros, often termed ' raphia grassland,' consists of coarse grasses which wither away during the dry season, interspersed with low bushes and the raphia palm—from which piassava, formerly an export of some importance, used to be obtained.

2b. *The Riverine Loam Region.*—This region, comprising the middle and upper river flats—banto faros—has been distinguished from region 2a for two reasons. These reasons also explain why the boundary between them has been drawn just below Kau-ur, in the north-south stretch of the river.

Firstly, the soils are lighter, having a higher sand content, and are more fertile. As far as could be seen on a fairly rapid tour, the soils above Kau-ur seem to be lighter, and those below heavier.

Secondly, although the lower parts of the flats are inundated during the rains, it is not with saline, but with fresh water. The

upper limit of salt water varies between the dry season and the rains. During the rains salt water extends up river for about 80 miles, nearly to Balingho. At Balingho itself there is a salt-free period of nearly six months, lasting from the end of August until the end of February. During the dry season, however, the water is saline for about 100 miles up river—between Elephant Island and Kau-ur—the exact limit being determined by the heaviness of the rains. These middle river banto faros are, therefore, much more useful agriculturally and more productive, and on them the most fertile soils in the Colony are found.

The natural vegetation of this region is very similar to that of region 2a, except that palm trees are no longer typical, but much clearing has been done for rice growing. These flats, composed of fertile alluvial loam and regularly flooded each rainy season—with rain water if not with river water—provide excellent rice lands. Elongated mounds of earth, ' bound ' with grasses and rushes, separate the various fields, and serve a dual purpose : they provide easily recognisable boundaries, and they retain the flood waters in the paddy fields. From a food-producing point of view this is probably the most valuable part of the Gambia and might be described as the ' granary ' of a Colony which since, and including, 1946 has grown enough rice for its own needs.

3. *The Mangrove Swamps.*—This region comprises long, narrow strips bordering the banks of the estuary and of the numerous creeks and tributaries which open into it. As the name implies, mangroves form the predominating, one might almost say the only, feature. They stand up in solid walls, often over 100 feet high, along the water's edge. Above Balingho on the north bank and Tendaba on the south they alternate with the banto faros which border the river more and more. They finally disappear in the N-S stretch of the river below Kau-ur.

This region to-day is of little use. It is very swampy, carries no population, and shelters all manner of wild life. Mangrove wood is generally used for fuel, and it has been argued [9] that much of the region could be cleared and drained for rice cultivation if suitable types of seed could be introduced, the wood obtained from the clearings forming a profitable by-product. It was estimated that 54,000 acres of mangrove swamp could be cleared for cultivation. When clearing these swamps, however, one has to bear in mind the danger of possible ' wash-outs '—severe local soil erosion—such as have occurred disastrously in the past. Clumps of mangroves should be left intact, therefore, as a protection—clumps rather than continuous lines which encourage the depredations by monkeys.

4a. *The Sandhills Region.*—In this region is found the most varied relief of the whole Colony, though the variation is not very considerable. The region is well drained, being developed on the porous Tertiary sandstone. Broad shallow valleys alternate with low hills—buttes. The soil is typically lateritic and infertile, while the natural vegetation may be described as ' parkland ' or savannah, coarse grass alternating with trees such as the baobab and the locust bean.

4b. *The Interior Plateau Region.*—This region is generally flat,

though at a level higher than the rest of the Gambia. It forms an extension or, rather, extensions of the Senegambian Tertiary Plateau referred to above. Except in its flatness this region is very similar to the previous one, with the same light, porous, infertile laterites and a savannah type of vegetation.

These last two regions, despite their disadvantages of infertility, are the most densely populated parts of the Gambia on the lower and middle river. This is largely because of the dangers of flooding on the riverine lands and the unhealthy nature of these banto faros. Furthermore, the poorer upland soils are the groundnut soils, from which the bulk of the population derives its living, for the groundnut, a legume, does well on these soils. A friable fairly light soil is necessary as the fertilised flowers develop an elongated torus or seed stalk which becomes rigid, deflexed, and which forces itself into the ground. Once there the ovary at its extremity begins to enlarge and develop into a 1-3 seeded pod. If the soil is so hard as to prevent the burying of the ovary, the whole part withers and no fruit is formed.[10] It is upon this product that the prosperity of the Gambia depends, accounting as it does for about 95 per cent. in value of the total exports of the Colony.

[1] This parallel of latitude constitutes a kind of E-W ' axis ' of the Gambia.

[2] Colonial Annual Reports : " The Gambia," 1946, p. 21. London : His Majesty's Stationery Office, 1948.

[3] Based upon a map in Cooper, W. G., " Report on a Rapid Geological Survey of the Gambia, British West Africa." *Gold Coast Geological Survey Bulletin*, 1927, No. 3.

[4] Cooper, W. G. *Op. cit.*

[5] Said to be so called because half of the original settlers there died of various diseases. It is largely flooded during the rains. For a consideration of the site of Bathurst and of its problems, see Jarrett, H. R., " Bathurst, the Problem Capital." *West African Review*, July, 1948.

[6] The estuary may be said to commence near Elephant Island because it is situated near the limit of salinity ; because it is in this area that the mangroves begin to disappear upstream ; and because the great breadth of the river below Elephant Island makes it look more like an arm of the sea than like a river.

[7] Jarrett, H. R. " Population and Settlement in the Gambia." *Geographical Review*, 1948, 38 (*4*) : 633-636.

[8] Banto (outside) faros (swamp) is a Mandinka (native) term for areas above river level that are dry during the dry season, swamps during the rains.

[9] " Report on Rice Cultivation in the Gambia." *Sessional Paper*, No. 2, 1943. Bathurst, 1943.
" Report of West African Oilseeds Mission." *Colonial No.* 224, pp. 19-20. London : His Majesty's Stationery Office, 1948.

[10] For further details regarding the most suitable conditions for groundnut growing, see, for example, Klages, K. H. W., " Ecological Crop Geography," p. 426. New York, 1942.

BOJUMBREEN—UPPER BOJUM SETER

MUNDAL—FJÆRLANDSFJORD

HEAD OF FJÆRLANDSFJORD—SUPHELLEBRE AND SUPHELLEDAL

# CHANGING TRANSHUMANCE IN FJÆRLAND

By H. A. Moisley and W. M. Moisley

A small area studied in September 1948 by some members of the Geographical Field Group [1] shows changes in transhumance which make an interesting comparison with the area recently described in southern Norway by D. E. H. Hayward.[2] The area was Fjærland, around the head of the fjord of that name, which is one of the northerly branches of the Sognefjord. It is a community of about seven hundred folk living near the fjord head ; their settlements are inter-connected by roads or tracks, except a few farms at favoured points lower down the fjord which are accessible only by water, because of the steepness of the fjord walls. As the fjord head valleys lead up to the mountains and ice-sheet—Jostedalsbre, Fjærland's only connection with the outside world is by boat. In such an isolated position one might expect the traditional pattern of transhumance to remain relatively unchanged, but this is not so.

In the short summer, animals are pastured at seters, which are of two kinds, either with huts in groups, or with more or less isolated huts. Grouped seters are seen in Mundal and Bojumdal (see Fig. 1), each farmer lower down the valley having his own hut in the cluster, which appears like a small village. Elsewhere the huts are more or less isolated, these being usually in the less accessible valleys or high up on some bluff or ledge—fjeld seters. The latter are usually connected with the farm below by a wire, down which milk cans, twigs—for winter fodder, firewood,[3] etc., can be lowered. Formerly the huts were occupied all summer by women and girls who milked the animals—mainly cattle in Fjærland—and made butter and cheese. Two seters were usually used ; animals being moved to the first in May, as soon as the snow cleared. In the case of farms with fjeld seters the first seter used was often on the sparsely wooded valley sides, or valley bottoms, close to the enclosed farm land, and no special hut for milking or sleeping was necessary. In Bojumdal and Mundal where grouped seter huts are used there are two groups, and that nearest to the home farms served a similar purpose to a number of home seters. Towards the end of June people and animals went to the further seters, in the case of the isolated ones to the fjeld seter, in the grouped seters to the further group ; here they remained until early September. The fjeld seters are usually high up near the upper limit of trees, but the grouped seters show no clear relationship to the tree line. In any case since the establishment of the seters the tree line has fluctuated in sympathy with the movement of the glacier, and within living memory it has moved nearly a mile up Bojumdal.[4] Occasionally a hay crop was taken off the lower seter, and sometimes it was grazed again for a week or two in September, when the animals were being moved homewards.

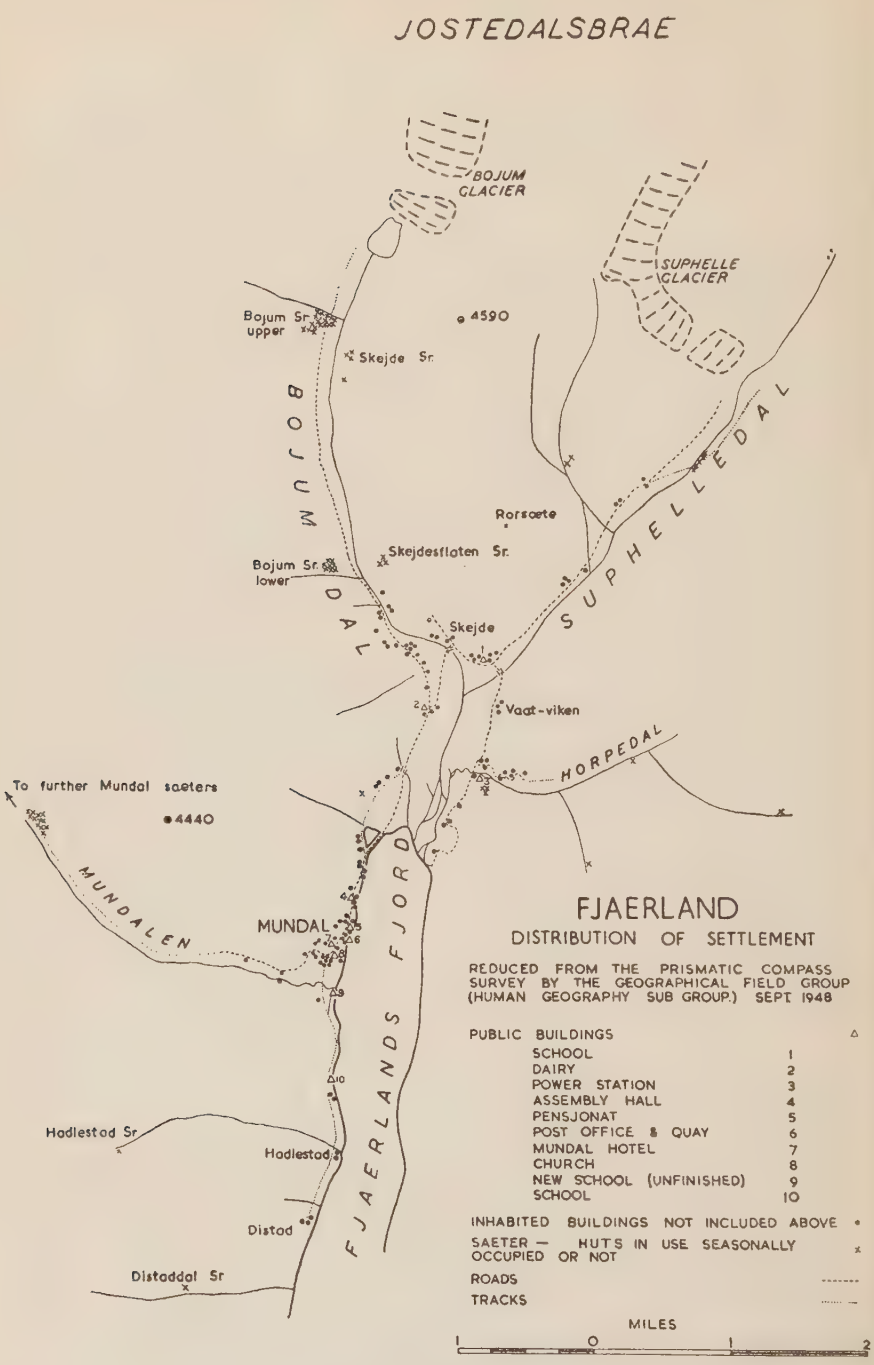



Fig. 1. Fjærlandsfjord : Distribution of settlements.

This traditional pattern (Fig. 2) is now changing, although in most cases the near and far seters are still grazed in their seasons. The nearest approach to the old arrangement remains in some of the fjeld seters, although the girls often make the arduous climb daily rather than remaining for the season. For example, Rorsaete, the fjeld seter of one of the Suphelle farms, is occupied only by the farmer's elderly sister ; his daughter climbs up and down daily. From such seters much of the milk, taken by wire, road and steamer, is now sold to dairies at Vik or Balestrand on the Sognefjord. A few of the most isolated seters are falling into disuse, partly because of the difficulty of getting women to stay at them, and partly because sales of milk are subsidised so that it pays the farmer to produce milk in places sufficiently accessible to be sold liquid, rather than to use the most inaccessible seters where it must be made into butter and cheese, which takes a good deal of labour and yields less money.

In the grouped seters of Mundal and Bojumdal a new economy prevails. The roads to these seters are good enough for people to cycle to them daily for the evening milking, staying the night and returning

Fig. 2. Grazing calendar at a farm in Suphelledal.
X ceremonies when starting for fjeld seter.

after morning milking to the farm to assist in hay making, etc. Milk for the farm is brought back—in rucksack-like cans—by the cyclists, and in the case of Bojumdal and the nearer seters in Horpedal and Mundal a lorry or car—there are six motor vehicles in Fjærland—collects the bulk of the milk each day and takes it to the quay, whence it goes by steamer to the dairies, and thence probably to Bergen. At these seters permanent residence is now limited to a few, often elderly, people, and then some stay only when cheese is being made.

Variations on these forms of transhumance do occur. One of the Vaat Viken farms sends cattle six miles by water to three seters further down the fjord. Cattle from Distad were taken across the fjord to a seter at the other side this year, because no one could be found to stay at the very high Distad fjeld seter.

Thus it seems that transhumance is being modified. As far as the people are concerned it is tending to become daily, and in some cases the most isolated seters are falling out of use. The changes can be accounted for mainly by changes in transport and marketing, particularly the use of bicycles and motor vehicles, and by the government subsidy on milk which encourages farmers to sell liquid milk to dairies. The latter in its turn is a reflection of improved communications in Norway generally, the setting up of large dairies, and the growing

urban demand for milk. Incidental, but not insignificant, is the shortage of labour on farms. But on the whole, the use of seter pastures is still a most essential part of the farmers' system, dictated as it is by the necessity of producing the maximum possible amount of winter fodder from the lower land and by the physiographic and climatic environment, and it is likely to remain so.

Photographs by courtesy of the Norway Travel Association.

[1] The Geographical Field Group is an association of students and teachers of Geography which arranges field studies abroad. It works through a committee elected annually by its members.

[2] HAYWARD, D. E. H. "Transhumance in Southern Norway." *S.G.M.*, 1948, 64 (2) : 71-80.

[3] Firewood, cut from the scrub birch, forms an important subsidiary source of income to most farmers. It is sent by small boats, mainly to Bergen.

[4] It is said that, many years ago, the glacier actually overwhelmed the upper Bojum seter.

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## REVIEWS OF BOOKS

### EUROPE

*The Magic of Skye.* By W. A. POUCHER, F.R.P.S. 11×8. Pp. 223. 148 photographs. End-paper maps. London : Chapman and Hall Ltd., 1949. 30*s*.

For Mr. Poucher, the magic of Skye lies almost exclusively in the mountains and crags, and the few glimpses of crofting life in some of his photographs are so entrancing that one almost regrets this. It is perhaps ungrateful, however, to ask for more, for within its limits the book could hardly be bettered. There are valuable introductory notes on the island as a whole : on accessibility, geology, weather, the Cuillins, easy ways for the walker, place-names, and an historical sketch.

The main strength of the book lies in its record of outings on the Cuillins and on the less well-known crags of the great basaltic spine of Trotternish. These accounts are given with a praiseworthy economy of words, and are of great charm, and with a wealth of beautiful photographs, so that even the non-mountaineer is reluctant to lay down the volume until it is finished. The photographic notes and data are not of less interest than other parts of the book. A. T. A. L.

*Regional Survey and Plan for Central and South East Scotland.* By Sir FRANK C. MEARS, P.R.S.A., LL.D., F.R.S.E., M.T.P.I. $12\frac{1}{2}\times8\frac{3}{4}$. Pp. xiv+180. 24 diagrams. 54 plates. 24 illustrations. Edinburgh : Central and South East Scotland Regional Planning Advisory Committee, 1949. 50*s*.

In this report, to the Planning Advisory Committee for the area, Sir Frank Mears stresses the two main problems facing the planning authorities : expanding coal production and rural depopulation. The proposal for dealing with the first are of great importance, particularly the concept of 'constellations' of towns, but it is the second which Sir Frank Mears has made particularly his own.

The evidence of population decline in rural areas is well summarised, and the remedies of improved housing, communications, public utilities and social services are dealt with. More emphasis, however, is laid on the problems of general rural rehabilitation and development involving proposals for agricultural and forestry projects which are beyond the powers of the local authorities forming the Advisory Committee. This results in many of the recommendations suggesting or implying new administrative machinery. As the report states, "... the full needs, as revealed

by regional survey, can at best only partially be met by the local and central bodies as at present constituted." The need is for a body with more comprehensive responsibilities.

The proposal for Joint Committees to consider matters of joint planning interest is a sound one, but the functions of the bodies to carry out positive development are less clearly defined. The problem of balancing local initiative and control and central financial assistance is made clear, but not solved.

The maps, printed by Messrs. W. and A. K. Johnston, are effective and do not, like the maps in so many planning reports, attempt excessive detail. In a book which will be used for reference by many people, the lack of an index is a drawback.

J. B. F.

*The Black Country.* By WALTER ALLEN. 9×7. Pp. 48+32. Drawings and water colours by Malvina Cheek. 60 photographs. Map. London: Paul Elek (Publishers) Ltd., N.D. 9*s* 6*d*.

It is not without good reason that a new series of books, edited by Clough and Amabel Williams-Ellis, and dealing with the English scene, should have been named *Vision of England.* In these well produced, slender volumes, text and illustrations give much interesting and unusual information, the particular charm of the series being largely due to the personal associations of the authors with particular parts of England. For most people the Black Country typifies all that is most sombre and repulsive in nineteenth-century industrialisation, but Mr. Allen's vision enables him to see it as a palimpsest and to decipher traces of the work of earlier hands. Among all the ugliness he is able to see, and most readably record, scenes of much interest—and even of beauty.

J. H. K.

*Conurbation: A Planning Survey of Birmingham and the Black Country.* By the WEST MIDLAND GROUP ON POST-WAR RECONSTRUCTION AND PLANNING. Foreword by Lewis Mumford. 11½×8½. Pp. iv+288. 12 illustrated sections. 15 coloured plates. 61 maps and diagrams. End-paper map. London: The Architectural Press Ltd., 1948. 30*s*.

In his foreword to this volume, Lewis Mumford comments that the foreign observer has ceased to be astonished at the quality of the thought that has gone into the surveys and plans for the redevelopment of urban England. It must be hoped that the British observer may also be included in this remark, provided that the cessation of astonishment is not accompanied by a diminution of interest. The part played by the Birmingham conurbation in the industrial story of Britain is sufficient guarantee of the significance of this volume.

In content, this survey starts with sketches of the physical and historical backgrounds, proceeds to analyses of population, industry, housing and other aspects of the region, and finally states conclusions. Illustrative of the quality of the text is the analysis of industry which will be read with great interest by geographers. The complexity of such analyses is well shown by one of the conclusions, to the effect that "On the whole, the Conurbation held its growth of population not so much because its industries grew faster there than elsewhere, but because it happened to contain industries that were growing relatively fast everywhere and to exclude industries that were diminishing everywhere."

The sustained attempt to evaluate local problems in terms of national trends is, in the reviewer's mind, one of the outstanding features of this survey. This theme of individual analyses finds expression in the conclusion that "A regional plan, such as that for the Conurbation, should fit in with, and be part of, a national plan for industry." Implementing this general statement is the specific conclusion that plans to restrict industry should consider carefully in what new areas such industries would redevelop, and consequently restriction should only be favoured in such cases as would result in true dispersion or diversification. In an ultimate analysis, it would seem to the reviewer that our great conurbations are economic segregations within a world framework, and the present survey, in its efforts to see well beyond the limits of its area of study, makes a notable contribution in this field. Finally, the volume is copiously illustrated with the maps, diagrams, graphs and photographs which we have come to expect from works of this kind.

S. J. J.

*Coventry's Heritage : An Introduction to the History of the City.* By Levi Fox. 7½×5. Pp. xii+192. 65 illustrations. 7 maps. Coventry : The Coventry Evening Telegraph, 1947. 6*s*.

Coventry's place in history, and the development, trade, industries, and government of the city, also the life of the citizen, are ably described by the former City Archivist. A selected bibliography is provided, and the book is attractively illustrated. J. H. K.

*Shakespeare's Country.* Photographs by S. W. Colyer. Foreword by Rt. Hon. The Lord Willoughby de Broke, M.C., A.F.C. 11½×9½. 33 reproductions in gravure, each with a commentary. London and Melbourne : Ward, Lock and Co. Ltd., 1947. 7*s* 6*d*.

The high standard of production of the *Fair Britain* series is exemplified in this volume. The excellent illustrations and informative commentaries interpret the charm of the Warwickshire countryside and of Stratford. J. H. K.

*Country of the Thames.* By Annan Dickson. 7½×5. Pp. xi+148. 87 illustrations. London : Chaterson Ltd., 1948. 8*s* 6*d*.

A pleasant but rather disconnected little book on the country of the Thames valley. Though well illustrated with many original photographs, the descriptive matter is somewhat sketchy, and for those who do not know the country well, the inclusion of maps would make this neat little volume more serviceable.

R. R. W.

*An English Farmhouse and its Neighbourhood.* By Geoffrey Grigson. 9×6½. Pp. 128. 30 plates in colour, from photographs by Percy Hennell. London : Max Parrish and Co. Ltd., 1948. 21*s*.

The main theme of this book is " the actual substance and the appearance, in detail, of the farmhouse and its buildings, and surroundings." The setting is a typical section of a chalk-scarp, from chalk upland to clay vale, located somewhere south of London. The contribution which this setting makes to the whole picture is well described in the first chapter on " The Neighbourhood." The structure of the farmhouse becomes the source of a series of short inter-related essays on Sarsen Stones, Chalk, Bricks, Thatch, Trees and other topics. The general descriptions are well supported by evidence of close observation, as when the author notes that chalk houses are frequently set " square to the compass," thus exposing only a corner to the south-westerly winds. The study of old building materials reveals a close intimacy between farm and environment, the fusion of dwelling and setting being an integral part of traditional growth. Clashing with this ancient unity is the galvanised iron and concrete of recent times. Mr. Grigson recognises, however, that the past must not be looked at too romantically and is most concerned with the changes of " an age between ages." Improvements, such as the better organisation of water supplies, are urgently necessary. What is vitally needed is that something new should spring from the same soil ; something in harmony with the present ; something that fosters a true continuance of a live tradition.

This book will be enjoyed by all who love the British countryside, and there is much in it of specific interest to the geographer. The plates by Percy Hennell add both artistic and instructional value. S. J. J.

*Wiltshire.* By Frank R. Heath. Revised by R. L. P. Jowitt. 6×3¾. Pp. xii+251. 60 illustrations. Map (1 : 253,440). [The Little Guides.] London : Methuen and Co. Ltd., and B. T. Batsford Ltd. Seventh edition, 1949. 7*s* 6*d*.

This is an excellent guide to a very English county of premier interest to the prehistorian and historian. It is thoroughly up to date, mentioning among other matters that the village of Imber has been permanently vacated to make a battle-practice ground. The preliminary general chapters are comprehensive.

C. R. V. G.

*Glastonbury, Somerset.* By H. F. Scott Stokes. 7×4½. Pp. 54. 32 photographs. Sketch map. Glastonbury : Clark, Son and Morland Ltd., Second edition, 1948. 4*s* 6*d*.

Glimpses of two thousand years of history, with apt and exceptionally good illustrations, are here presented in a well produced booklet. " Here still, 2000 years after the still unknown end of the first ' Glastonbury,' and more than 400 years after the destruction of the Abbey, a busy little community goes about its business, farms its lands, dresses its leathers, and makes and markets its merchandise and produce ; and bids you welcome." J. H. K.

*Prehistoric Gower :* The Early Archaeology of West Glamorgan. By J. G. Rutter. 8½×5½. Pp. 90. 10 figs. 23 plates. 14 maps. Swansea : Welsh Guides, 1948. 10*s* 6*d*.

The primary value of this work lies in its comprehensive collection of archaeological material for Glamorgan west of the river Neath. It does not provide an analysis of the various distributions of the material, and the distribution maps do not show with sufficient accuracy the location of sites and finds. In addition, these are plotted against the geology, whereas it has been demonstrated in recent years (W. E. Grimes : " Early Man and the Soils of Anglesey." *Antiquity*, 1945, No. 76, p. 174) that soil, controlling vegetation cover, was a far more potent factor influencing the distribution of prehistoric settlement. R. M. P.

*Gower Caves.* Part II. By E. E. Allen and J. G. Rutter. 8½×5½. Pp. 31-60. Figs. 50-54. 14 photographs. 4 maps. Swansea : Welsh Guides, 1948. 5*s*.

The first part of this contribution to British spelaeology was published in 1946 [see *S.G.M.*, 62 (*3*) : 130]. The second part contains the results of the authors' survey of another sixteen caves, together with a chronology of prehistoric man in the Gower caves, and with a list of the Pleistocene fauna. The authors examined more than ninety caves and apertures, but the descriptions are limited to caverns of archaeological or general interest. J. H. K.

*The Land of Ulster.* The Report of the Land Utilisation Survey of Northern Ireland. Part I. *The Belfast Region.* By Douglas A. Hill, M.A. 10×7½. Pp. xii+135. 28 figs. 36 maps. Belfast : His Majesty's Stationery Office, 1948. 7*s* 6*d*.

The Land Utilisation Survey of Northern Ireland was initiated in 1936 [see *S.G.M.*, 63 (*1*) : 17-19]. When eighty-five per cent. of the primary mapping had been done, the work was interrupted by the war. Other difficulties, Professor E. Estyn Evans points out in his general introduction, were the small scale and intricacy of the field pattern and the drumlin topography. The work proved too much for school children. The Survey was co-ordinated throughout by Mr. Douglas A. Hill, the author of the present Report on the Belfast Region, and received cordial support from the Government of Northern Ireland, by whom the Reports are now being published.

The ground covered by the first Report includes three major physical regions : the basalt uplands of South Antrim ; the middle Lagan valley and Belfast Lough lowlands ; the slate hills and valleys of North Down. Mr. Hill emphasises the concentric pattern of all the distributions within this area, with Belfast as focus, and the notable mutual dependence of city and countryside. Four major cropping types are distinguished : grassland, in which cereals and potatoes are under five per cent. of total crops and grass ; two types of tillage, in which older grass is less than eight times recent grass, and differing in the proportion of crops other than potatoes and oats ; mixed, in which potatoes and oats are over five per cent. but older grass more than eight times recent grass. Three live-stock types are recognised : dairying ; stock-raising—mainly beef and store cattle, and pigs ; sheep. The land use regions of the area number twelve.

A notable feature of the Report is the section on climate, which contains many interesting data, with diagrams, concerning temperatures for the growth and ripening of cereals. There are eight pages of useful bibliography, and the Report has an attractive format. C. J. R.

*Directory of Iceland, 1949.* Edited by HILMAR FOSS. 8×5½. Pp. 692. Reykjavík : Islenzk Arbok H. F. Twenty-sixth edition, 1949.

This annual publication [see *S.G.M.*, 1948, 64 (*2*) : 102] has been brought up to date, and new information has been added. The name of the publishing company has been changed in order to conform to recent regulations. J. H. K.

*Look at Norway.* By ARNE DAMM and CARL JUST. 10×7. Pp. 192. Introduction and photographs. Sketch map. Oslo : N. W. Damm og Søn, 1949. *Kr.* 16.80.

It is difficult to imagine a reader who would not find joy in this outstandingly well produced volume—even the dust-cover is pleasing. This is not a mere collection of familiar views but an attempt—a successful attempt—to depict by camera present-day life in Norway and its natural and cultural background. The superb photographs will engender a desire to become more closely acquainted with this modern European democracy, and to take a first-hand *Look at Norway.*

Introduction and explanatory notes are in English as well as Norwegian, and readers will also appreciate the high quality of Norwegian book-craft.

J. H. K.

*Tour on the Continent, 1765.* By THOMAS PENNANT, Esq. Edited with notes by G. R. DE BEER, F.R.S., P.L.S. 8½× 5½. Pp. xii+178. Frontispiece. 8 plates. London : Ray Society, 1948. Bernard Quaritch Ltd. *17s 6d.*

The author of this book was a very distinguished zoologist, but he is better remembered as one of the notable eighteenth century English travellers : he actually explored those outlandish regions known as Scotland and Wales, till his time little visited by the Southron, and the published record of his journeys was so satisfying as to evoke the admiration of Dr. Johnson.

The book under review is a very interesting and objective account of a six months' excursion made within two years of the close of the Seven Years' War. It took the author by Paris, Burgundy and Dauphiné to Switzerland, and thence through Bavaria and the Rhineland to Holland and Flanders. During the course of this trip he met many famous personages, including Buffon and Voltaire. He observed everything and everybody : landscape, crops, towns, castles, arsenals, hospitals, asylums, churches, convents, libraries, but especially people, their manners and their "cabinets," which term covers all kinds of collections from a case of "stuft" birds to valuable museums of natural history and art. The writing is simple and unpretentious, and, apart from the occasional obsolete word or usage, astonishingly modern. The book is adorned with nine portraits. R. T. C.

*Geographisches Taschenbuch 1949.* Prepared by the AMT FÜR LANDESKUNDE. Edited by E. MEYNEN. 6¾×4¾. Pp. 242. 16 figs. Jungingen (Hohenzollern) and Stuttgart : Reise- und Verkehrsverlag, 1949. *DM* 6.80.

The 'Amt für Landeskunde,' presently located in Landshut (Bavaria), is the central institute concerned with the collection, co-ordination, and dissemination of information pertaining to the geography and habitat pattern of Germany—based on detailed local and regional surveys. The Institute maintains a central library and map collection, catalogues of relevant and cognate publications and of place names, also a service for mapping population, settlement, and economic data. The organisation is under the direction of Professor E. Meynen, and the work of the Institute is carried on in close and constant co-operation with regional administrative authorities and college staffs. Guidance is given to planning and other authorities, and the Institute issues reports, maps, statistics, research papers, and other publications.

One of the latter is *Geographisches Taschenbuch,* in some respects a successor to the *Geographenkalender* which was published annually from 1903 to 1914. In the *Taschenbuch* is compressed a great amount of information valuable mainly to those engaged in studying the geography of Germany but also to geographers in general. Information about the calendar and time zoning, deaths and jubilees of German geographers, is followed by a chronology of outstanding events in the development of geography, 'Landeskunde'—a synthesis on a country-wide scale of local and regional ecological geography—and cartography in Germany ; lists of

geographical congresses and of reference books dealing with scientific institutions and societies ; a directory of German university departments of geography ; the Amt für Landeskunde ; geological institutes ; meteorological service ; hydrographic organisations ; agricultural and forestry authorities, colleges, and research institutes ; planning authorities ; the more prominent scientific societies and libraries. There is a useful bibliography of bibliographies and of handbooks, and a list of recent German city and town plans.

The trend and methods of the present survey, or ' Landeskunde,' of Germany are discussed : the ultimate basis is the smallest unit of approximately uniform ecological environment, which can be conveniently shown on a scale of 1 : 25,000. Similar unit sites or ecotopes—called ' Fliesen '—may be grouped in the 1 : 200,000 map, or may be associated spatially with related unit groups to form a composite group. Such complexes form the basis for further integration—for mapping on the scale of 1 : 500,000—into larger areas, regions and, finally, into a natural ' zone.'

Other features included in this publication are : the arrangement of regional surveys ; geographical and statistical data with reference to Germany ; definitions of cartographical terms ; hints for research and mapping ; suggested symbols for land utilisation maps ; a table of constants ; and, finally, a list of postal addresses and birthdays of German geographers. J. H. K.

*Oblicze Ziem Odzyskanich. Dolny Slask.* 8½×6. Vol. I. *Przyroda. Gospodarka.* Pp. 459. 100 figs. Map of Silesia (1 : 1,000,000). Vol. II. *Dzieje. Kultura.* Pp. 773. 181 figs. Wrozlaw and Warszawa : Ksiaznica Atlas, 1948.

The general title of the series to which these two weighty volumes belong is " The Face of the Recovered Lands." The avowed purpose of the book is to assemble from every source indisputable evidence that Lower Silesia is and always has been Polish. The first volume deals with physical features, flora, fauna, agriculture, mineral wealth, power, industry, and trade. The second volume, by far the larger, discusses history and civilisation, covering all aspects of these fields, not excluding language and literature.

Some two dozen authors treat as many different topics, and each section has its remarkably extensive bibliography. There are numerous illustrations—photographs, wood-cuts and simple line drawings ; the representation of plants and animals is very pleasing. Numerous tables and sketch maps help the exposition of the matter. There is one very detailed map in colour, and each volume has its own index of names of persons and places.

This comprehensive and learned work would have been of much greater interest and usefulness in this part of the world had the editors supplied for each chapter a summary in some western European language of the essential points and conclusions. R. T. C.

*Touraine, with Anjou and Maine.* Edited by Alan Houghton Brodrick. 8×5½. Pp. xxxi+368. 200 photographs. Sketch map (1 : 633,600). [The People's France, Vol. 2.] London : Hodder and Stoughton Ltd., 1948. 18*s*.

This is the second volume of *The People's France* and a beautiful and worthy successor to the volume on Normandy [see *S.G.M.*, 1948, 64 (*1*) : 52]. The arrangement of the matter is along similar lines : a general introduction discussing characteristics of land and people, climate, products, history, followed by always interesting notes—geographical, historical, literary, etc.—on localities arranged alphabetically and illustrated with a vast number of photographs.

As a book for the arm-chair traveller it is wholly delightful. If this volume and those yet to appear are designed to compete with existing guides for actual travellers in space, one or two suggestions may not be unwelcome. Even, if necessary, at the cost of abbreviating some of the separate notes, the general introduction might be extended and include some attempt to put the very abundant subsequent detailed information into perspective : after all, the traveller must choose and wishes to prefer the best. Then, the map should have a grid, and with each name dealt with in the text the map-reference should be given. Also, reference should always be given to the pages on which the photographs of any given locality are to be found. R. T. C.

*L'Auvergne et le Velay.* By LUCIEN GACHON. 9×5½. Pp. 350. 42 figs. 16 plates. 2 maps. [Les Provinces Françaises, No. 1.] Paris: Librairie Gallimard, 1948. 760 *fr.*

This comprehensive study describes and analyses the basic material culture of peasant communities in a section of the Plateau Central as seen against the background of their physical environment. The main theme is that until the later nineteenth century change was sufficiently slow in these relatively secluded areas to allow a strong peasant culture to absorb the better elements. From the later nineteenth century, however, change became more rapid with the development of the Clermont Ferrand industrial area, and the old life has subsequently tended to disintegrate. The N-S axial belt of communication along the valley of the Allier has been one of the main avenues of change.

The geographer will be particularly interested in the discussions of house types, farming methods, and domestic and agricultural equipment. An interesting feature of the book is the attempt to show in the distribution maps of material culture traits the local centres of origin, in the sense of the areas where the traits considered seem to be longest established. It is to be hoped that further volumes in this series will soon appear, as such work must occupy an important place in geographical literature. Close studies, such as this, of material cultures of long standing are vital to true interpretation in regional geography. S. J. J.

*Mountain Paths.* By H. E. G. TYNDALE. 8½×5½. Pp. x+208. 15 photographs. [The New Alpine Library.] London: Eyre and Spottiswoode (Publishers) Ltd., 1948. 12*s* 6*d*.

While still at school, the author was fortunate in coming under the influence of Mr. R. L. G. Irving and to go on guideless expeditions in Switzerland under his leadership. The author starts with descriptions of his earliest ascents, and ranges over the whole of the Alps and includes many places which are not well known to all climbers. He was a keen lover of mountains and of the Alps in particular and has produced a most delightful account. It is sad to think that owing to his death this will be the last book which will come from his pen. It is a book which can be most heartily recommended. A. H.

*The Land of Italy.* By JASPER MORE. 8½×5½. Pp. viii+264. 164 illustrations. End-paper maps. London: B. T. Batsford Ltd., 1949. 18*s*.

Mr. More has coped successfully with the difficulties of providing for the variegated Italian scene an introductory survey that is short but adequate to guide the would-be tourist to the regions that are likely to meet his taste. A larger proportion of space than is usual in a book of this type is given to the South, and if there are any of this generation with romantic illusions concerning Italy from Rome southward, his warning remarks should prevent their pleasure in the Mediterranean scene being marred by the shock of first encounter with some of its concomitants.

On the whole the author is more appreciative of the urban than of the rural landscape, and this is reflected in the choice of illustrations. He makes the surprising statement that " except for the mountaineering zones of the Alps and the Dolomites and for a small area from Northern Tuscany to the Marches, Italy is entirely unsuitable for the walker." In his useful general remarks about practical matters Mr. More does not mention two notable Italian contributions to the convenience of the wayfarer: the *albergo diurno* and the *espresso* bar. The traveller that purchases the *panforte* of Siena on the strength of the author's remark that it is " a kind of marzipan " will be surprised; its name truly indicates its consistence. Some of the more humorous statements in the introductory chapter may be regarded as *ben trovati.* C. J. R.

*This is Greece.* By ISOBEL L. HUNTER. 8½×5½. Pp. 102. Frontispiece. 16 photographs. End-paper sketch maps. London: Evans Brothers Ltd., 1947. 8*s* 6*d*.

This is a brief but comprehensive source of general information, in sufficient detail to be of value to the visitor of Greece, while the student will appreciate the opinions of an obvious authority. Though impartial in presentation of fact, Miss

Hunter is inspired by longstanding personal contact with the country and its people. With the aid of interesting illustrations, she graphically describes the country, and reveals the people as strong individualists, their distinctive arts, crafts, and customs accentuating strong national and political feeling. Skilfully the history and culture of the old Greece are welded with the vitality of the new, so that, though one is given the impression of poverty and economic vulnerability, there is also a note of considerable hope for the future. B. M. W. T.

*Hellenic Travel.* By W. A. WIGRAM, D.D. 8½×5½. Pp. 266. 27 photographs. 2 sketch maps. London: Faber and Faber Ltd., 1947. 15*s*.

Few names are more closely identified with Hellenic studies and travel than that of Dr. W. A. Wigram, and consequently a very high standard of scholarship is expected in a book by this author on his favourite subject. Readers will not be disappointed. Whilst such centres as Crete and Istanbul each have a chapter devoted to them, and while mediaeval and modern as well as ancient history are woven into the story, the bulk of the book deals with ancient Greece and the glory that was hers as a pioneer of civilisation and culture. Some knowledge of the subject on the reader's part is assumed, but to those who already have, much is added. Those who have still largely to discover for themselves the grounds on which are based the claims of ancient Greece to immortal fame will, too, find here the source of much profit, enjoyment, and intellectual stimulus.

History, legend, religion, art, and archaeological research are all laid under contribution, and the result is a very readable and instructive volume. Its attractiveness is enhanced by excellent illustrations. J. E. P.

*Malta: An Account and an Appreciation.* By Sir HARRY LUKE, K.C.M.G., D.LITT. (OXON.), HON.LL.D. (MALTA). 8½×5½. Pp. 200. 9 figs. 55 plates. 2 sketch maps. London: George G. Harrap and Co. Ltd., 1949. 15*s*.

The author was Lieutenant-Governor of Malta from 1930 to 1938 and, in view of his record as a writer on Near Eastern lands, many of us must have been awaiting the book now under review. *Malta* has been well worth waiting for. Sir Harry Luke's matter and style are as attractive as ever whilst, unlike earlier writers, he shows an intimacy with the Maltese language.

The author has devoted more space than some of his predecessors to the periods before and after the sojourn in Malta of the Knights of St. John. The years of the Grand Masters remain of commanding interest, but the attempt is made to show that these were but a passing episode in the story of an island that must in Neolithic times have been something akin to a Greater Delphi, serving the entire Mediterranean. In a happy sentence on the penultimate page, the Second Siege is set in its historical perspective—as Malta's revenge on Rome for the destruction of her mother, Carthage, twenty-one hundred years ago. Sir Harry Luke is rightly at pains to stress that the Maltese people form a tiny, but quite distinctive, nation of their own.

The photographs are excellent and well chosen. They include an intriguing view of the Maltese archipelago from the air. J. E. P.

## ASIA

*A Short History of the Middle East from the Rise of Islam to Modern Times.* By GEORGE E. KIRK, M.A. 8½×5½. Pp. x+301. 14 sketch maps. London: Methuen and Co. Ltd., 1948. 16*s*.

As a former lecturer in the Middle East Centre of Arab Studies, Mr. Kirk has special qualifications for writing on his subject, and has also had special advantages, of which he has made abundant use. His *History* is a straightforward account of events since A.D. 600, with particular emphasis on the twentieth century; and within 300 pages has been assembled considerable and detailed information on contemporary affairs. Despite this emphasis on the present day, a remarkable balance and perspective are maintained between larger movements and influences.

Much of the later pages present entirely new material that gives a factual basis

to many of the rumours and hearsay that have shrouded Middle Eastern developments of the last fifteen years : for example, the precise relationship between the British forces and the Egyptian Court during the first months of 1942 is made startlingly clear ; and the intrigues in Iraq since the death of King Feisal, and the part Russia has played in Iran, are both objectively described. Mr. Kirk does not mince his words—there is no attempt to ' write down ' the interplay of intrigue, violence, and power politics that still characterises Middle Eastern affairs ; and he never glosses over the faults of individuals or governments—Arab, British, French, American, or Russian.

A penetrating and discerning economic survey brings out the self-interest of outside powers, and the limitations and weaknesses of Arab society. Throughout the book there is one strong implication—the need for closer detailed understanding of people and environment in the Middle East before any of the immensely serious problems of the region can be successfully handled. For its factual basis, objective discussion of current difficulties, and absence of prejudice—and also of illusions—Mr. Kirk's book can be warmly recommended as an outstanding and indispensable contribution to Middle Eastern studies. W. B. F.

*Eothen, or Traces of Travel brought Home from the East.* By A. W. Kinglake. Introduction and Notes by Robin Fedden. $6\frac{1}{2}\times4\frac{1}{4}$. Pp. xxx+338. London : Methuen and Co. Ltd., 1948. 6*s*.

This latest edition of *Eothen* would seem to be intended both for the general reader and for schools. As Kinglake's text is naturally mainly geographical, Mr. Fedden has supplied a short historical background, which, however, might be adversely criticised on the grounds that it devotes attention to contemporary problems —a century *after* Kinglake—, and also because the style occasionally is too heavy for younger readers : *e.g.*, " it is a world whose real values—spiritual, cultural, and social—the hurrying and pragmatic West can appreciate only with difficulty." Otherwise, the edition can be recommended as a scholarly production written with deep insight into Middle Eastern ways. W. B. F.

*Kingdom of Adventure : Everest.* A Chronicle of Man's Assault on the Earth's Highest Mountain, narrated by the Participants. Accompanying text by James Ramsey Ullman. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. 320. 29 plates. 4 sketch maps. London : William Collins, Sons and Co. Ltd., 1948. 21*s*.

Mr. Ullman has compiled an anthology from the various mountaineers who have written of their experiences of Mount Everest and has linked these up, and has given, in addition, a short account of the discovery of Everest and the efforts which have been made in organising expeditions to ascend it. The early flights over Everest are also dealt with.

Mr. Ullman has framed a most readable book which enables the reader to get a comprehensive picture of the expeditions and of the associated problems. A. H.

*Mount Everest, 1938.* By H. W. Tilman. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. 160. 48 illustrations. 4 maps. Cambridge and London : Cambridge University Press, 1948. 15*s*.

In his introduction, the author far too modestly refers to this latest work of his as, perhaps, a duller chapter added to the last book on Mount Everest, Mr. Rutledge's *The Unfinished Adventure*. The adventure may be unfinished, but this is certainly not a dull chapter in the story : the account of this 1938 expedition captures one's interest right from the start.

Instead of an elaborately equipped large expedition, here, in this last attack, was a carefully selected group of seven men—Charles Warren, Peter Lloyd, P. R. Oliver, F. S. Smythe, N. E. Odell, E. E. Shipton, and H. W. Tilman, the leader—whose average age was around thirty-seven. With a small, first-rate group of willing Sherpas, they followed the usual route from the rail-head northwards into Tibet, setting out somewhat earlier and reaching their base at Rongbuk more quickly than former, more cumbersome expeditions. This early start gained them little advantage, temperatures being too low at the end of April to make climbing above Camp III possible. Further advance on the mountain was delayed for a

month. On 6th June, Camp V was established in face of unusual weather conditions. Camp VI, at 27,000 feet, was set up, but snow and wind conditions above this point defeated the gallant attempts that were made to go further.

The things of the spirit, which mountaineering fosters, appear to cultivate in a mountaineering author a felicity of language and artistry in expression which make his books a joy to read. Mr. Tilman's book maintains this high standard, while the photographs which accompany the text are superb. A. T. G.

*Artist in Unknown India.* By MARGUERITE MILWARD. Foreword by Professor H. J. Fleure, M.A., D.SC., F.R.S. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. xiv+274. 98 illustrations. Map. London : T. Werner Laurie Ltd., 1948. 21*s*.

This book contains an account of Mrs. Milward's experiences and observations while in search for models for her sculptures of racial types among the ancient and aboriginal tribes of India. The search inevitably led away from the cities and more populous, well-known districts, to remote forests or mountain fastnesses in southern, central and north-eastern India, providing contrasts in physical and cultural landscapes which the author has been quick to recognise. But the study of primitive peoples in their precarious refuges was her chief concern, and we are indebted to her for making available to a wider public, in a most interesting form, details concerning these little known tribes.

Of the artist's achievement, under most difficult conditions, the numerous and excellent plates, of models and heads, accompanying the text are ample evidence ; while in the preface, Professor Fleure has assessed the value of the original measured portraits to anthropological studies. It is in the light of his remarks that Mrs. Milward's work, as artist and author, is best appreciated.

The map and index at the back of the book are very useful ; but unfortunately the plates are not placed adjacent to relevant descriptive passages. W. M. D.

*Burma's Icy Mountains.* By F. KINGDON WARD, B.A., F.L.S., F.R.G.S., V.M.H. $8\times5\frac{1}{4}$. Pp. 287. 16 photographs. 2 maps. London : Jonathan Cape Ltd., 1949. 15*s*.

Two expeditions are described, one under Kingdon Ward's own leadership, the other, a zoological and ornithological expedition on behalf of the American Museum of Natural History, which he joined. One ended in January 1938, the other commenced in November 1938. Few men could have worked under such diverse conditions in one year, for Kingdon Ward by himself at times had only about a dozen coolies, while the other show had eighty mules and forgot to supply waterproofs for the loads ! On both, the main interest for the author was plants, but each trip had a diversionary interest : with the Americans it was birds, with his own he " wanted a change. So why not break new ground and combine topographical and botanical exploration." So after he had " found my alp—two of them, or perhaps one and a half and a fair number of plants," he made a reconnaissance to a snowy peak, Ka Karpo Razi—19,269 feet : " a Gothic cathedral in white marble floating on an azure sea encompassed by space. Every spire and vault shone with an unearthly luminous brilliance." This reconnaissance showed him " the high alpine valleys of far north Burma " and " the enormous disintegration of these mountains at the headquarters of the Irrawaddy valley." The land was too broken for him to do much about it.

The three months trek to reach areas above 10,000 feet has incidents to brighten it. The cow among the capsules is a novel variant of the bull in the china shop, and there are many others, but this was the third time in twelve years that Kingdon Ward had visited the mountains at the source of the Irrawaddy. On his own, he went two hundred miles north of Myitkina. With the others, the Burmese Chinese frontier—about 26° N, 98° 50′ E, only one hundred miles from the same base—was visited, and one plant of more than major local interest was the coffin wood tree which is cut and traded to the Chinese. Those who know the conditions of the Wet Himalayas, their people, plants, animals *and* insects, will find memories vividly stimulated. The illustrations of the author's usual high standard depict many aspects.

R. E. C.

*The Chinese in Malaya.* By VICTOR PURCELL. 8½×5½. Pp. xvi+327. 6 sketch maps. London : Geoffrey Cumberlege, Oxford University Press, 1948. 18*s.*

In this volume, issued under the joint auspices of the Royal Institute of International Affairs and the Institute of Pacific Relations, is outlined the growth of the Chinese in the Malay Peninsula. While Chinese emigration commenced at an early period, it was not until the country came under British control that the emigrants were welcomed. From this time the flow of Chinese into the country rapidly increased until in 1941 they outnumbered the Malays for the first time. It is mainly due to the enterprise of these Chinese that the Modern Malaya has evolved. The author discusses from every aspect the growth and development of this Chinese society. Particularly interesting are the final chapters on the Chinese during and after the war period. It is shown that Malaya has ceased to be purely Malay : it is a plural society, and the race predominant in industry and commerce, in capital and in labour, in economics and in politics, is the Chinese.

The author, who has had long experience of the Chinese in Malaya, is to be congratulated on this authoritative treatise. J. A.

*A House in Bali.* By COLIN MCPHEE. 8×5. Pp. 214. 53 photographs. Sketch map. London : Victor Gollancz Ltd., 1947. 18*s.*

A young American composer, fascinated by gramophone records made in Bali and played in New York, wished to learn more of the music of the Malays, of the musicians and the dancers. The result was a stay in the tourists' centre of the East Indian archipelago. *A House in Bali* will appeal to all who share Mr. McPhee's interests. C. R. V. G.

*The Background of Eastern Sea Power.* By F. B. ELDRIDGE, M.A. 8½×5½. Pp. ix+386. 17 illustrations. 20 sketch maps. Melbourne : Georgian House. London : Phoenix House Ltd., 1948. 18*s.*

Here is narrated the part played by sea power in the Indian and Pacific Oceans from the earliest recorded times until the end of the Seven Years' War. The author has assembled into one volume material gleaned from many widely scattered sources, some of them inaccessible to the general reader. The chapters devoted to the maritime activities of Asia's own peoples are especially interesting, but a point which emerges is that with one minor exception none of these east of Arabia were interested in naval power as such. Why ? Neither did they ever attempt to establish a commercial empire based on the ocean. Why not ? These vital questions remain unanswered. Mr. Eldridge is a retired naval officer and satisfied to confine himself to recording maritime happenings for their own sake.

During the period under review, the littorals of the Indian and Pacific Oceans did produce one state with sea-minded rulers, living by sea-borne trade and sending forth sea-borne colonists, as did their ancient Phoenician kindred in the Middle Sea. We should like to know more about Arab activities, but unfortunately the Arabian and Azanian Seas are remote from the areas in which Mr. Eldridge, an Australian, is primarily interested, and the name Oman does not even appear in the index.

C. R. V. G.

## AFRICA

*New Song in a Strange Land.* By ESTHER WARNER. 8½×5½. Pp. 302. Illustrated by Jo Dendel. London : Victor Gollancz Ltd., 1949. 16*s.*

Mrs. Warner tells of her experiences in Liberia, where she accompanied her husband on a Firestone plantation. This book is most refreshingly out of the ordinary run. The author is a wood-carver and made many contacts with the natives through that interest, but the quality which above all distinguishes her from most of us is her absorbing interest in people as opposed to things. She offered to the African that warm sympathy and, indeed, love without which so few of them will expand and show his heart. And unless more of us come to realise how much the African values warm personal interest, the material gifts western civilisation has to offer will not bring us trust and gratitude but envy and bitterness.

Mrs. Warner does not appear to have lived long in Liberia, for she describes as amusing novelties many of those incidents and characteristics which a longer sojourn inevitably makes even a saint regard as vexations and discomforts. These experiences, however, she recounts in a most charming manner, and she is particularly successful in capturing the quaint charm that can exist in ' pidgin.' Definitely a book to be read by those who wish to know Africans as opposed perhaps to Africa. R. M.

## AMERICA

*Land of the Dacotahs.* By Bruce Nelson. 9×6. Pp. vi+354. 26 illustrations. Sketch map. Minneapolis : University of Minnesota Press, 1946. London : Geoffrey Cumberlege, Oxford University Press. $3.75, or 21*s.*

Custer's Last Stand and the name of the Sioux chief, Sitting Bull, are not altogether unknown on this side of the Atlantic. But there is less appreciation of the significance of the Upper Missouri Valley and of the history of its original inhabitants in relation to that of ' white ' settlement in what are now the States of Montana and North and South Dakota, and to the history of the U.S.A. Mr. Nelson's study of the region has found expression not as an orthodox academic account, but as an unusually vivid and, in part, dramatic presentation of events from early Asian invasions to the Seven Council Fires of the fierce Dacotahs, and to the current endeavour to establish a regional planning authority, the MVA.

Space inhibits mention even of the more outstanding chapters of this narrative. Mr. Nelson's critical discussion of personalities and of social, economic, and political life is well documented. Indian and Pioneer lore and legend are so adroitly blended with the less romantic phases of Upper Missouri history that his book—written with verve and, on occasion, not without caustic humour—will commend itself not only to the student of American history and ethnology : the general reader will discover that this factual history may outvie, and certainly outvalues, the fictional Wild West ' thriller.' J. H. K.

*From Santos to Bahia.* By Hakon Mielche. Translated from the Danish by M. A. Michael. 8½×6. Pp. 350. Marginal sketches and 25 illustrations. End-paper decorative maps. Edinburgh, Glasgow, and London : William Hodge and Co. Ltd., 1948. 15*s.*

It is with pleasure one welcomes another book written by Hakon Mielche. There is here the same colour and vivacity that has characterised his previous books. In the present volume, one is brought to realise the life and vigour, the great riches, and the vast potentialities of south-eastern Brazil. The author lands in Santos and journeys via São Paulo to Bahia, with expeditions to the coast and to the interior at a number of points on his route. Thus he misses little of the great farming development inland from São Paulo, or of the mineral wealth of Minas Geraes. The description of São Paulo is particularly enlightening as an epitome of the surging vitality of present-day south-eastern Brazil. As in his *Land of the Condor* [see *S.G.M.*, 1948, 64 (*3*) : 163], the author is not content to keep to the beaten tourist track but manages to get down to the everyday life of the people and to the human geography of the region.

The English translation is particularly good. Lastly, the book is well worth looking at if only for the amusing pen pictures which decorate the margins of each page. A. T. G.

*Enchanted Trails.* By Sir Christopher Gibson, Bt. 8½×5½. Pp. 272. 34 photographs. Sketch map. London : Museum Press Ltd., 1948. 16*s.*

Books on Paraguay are few, which no doubt is due to the lack of Europeans in that small and secluded state. Here is one by a man who has spent most of his life in South America and who knows Paraguay from end to end. He writes in a colloquial and even slangy style, and certainly conveys to his readers the scenery and life of Paraguay, with emphasis on its animal life. R. N. R. B.

*A Yanqui in Patagonia : A Bit of Autobiography.* By BAILEY WILLIS. 9½×6. Pp. x+152. 25 illustrations. 7 sketch maps. End-paper maps. Stanford : Stanford University Press. Second printing, 1948. London : Geoffrey Cumberlege, Oxford University Press. $3.50, or 16*s*.

A lavishly produced and well illustrated book on northern and central Patagonia. The author is a well-known professor of geology who for long was a leading figure on the United States Geological Survey, and was the author of the geological map of North America published in 1911. Among his many travels in all parts of the world were surveys from 1911 to 1915 in northern Patagonia on behalf of the Argentine government.

After a few chapters on his early life and his experiences in the American west —surveying a way for the Northern Pacific Railway—Professor Willis moves to the Argentine area in a survey to promote development and colonisation. The swing of Argentine politics at times impeded his work, but on the whole he triumphed, and he has written a vivid account of the country and the people whom he met. The area includes the Moreno National Park, based in that area which Dr. F. Moreno, the most enlightened of Argentine scientists, originally gave to the state. Much of Willis's work was published in *Northern Patagonia* or *El Norte de la Patagonia* (New York, 1914), but this volume goes farther south and west, and reveals much new country. There are interesting speculations on the remains of the giant sloth and the human skeletal fragments found fifty years ago at Last Hope Fjord.

The book is never dull and has good illustrations and several maps. The author at the age of ninety has achieved a great success. R. N. R. B.

*Uttermost Part of the Earth.* By E. LUCAS BRIDGES. Introduction by A. F. Tschiffely. 9½×6. Pp. 558. 97 illustrations. 5 maps. London : Hodder and Stoughton Ltd., 1948. 30*s*.

Since the middle of last century, Thomas Bridges and his son have spent their lives in Tierra del Fuego. Before that, the archipelago was almost unknown except for the voyage of the *Beagle* and a few ill-fated missionary endeavours. This book deals of the Argentine part of Fuegia, that is, the eastern and southern parts. Against difficulties of climate, soil, transport, and ill-conditioned Indians, the Bridges and a few associates struggled valiantly and won through.

The white population to-day is small, perhaps 5600, and the dwindling Indian population has fallen from some 8000 to 150 and a few half-breeds. But there are scattered settlements, such as Ushuaia with a population of 2800, and Rio Grande with 1800. These and others are all due to the efforts of the Bridges. Argentine rule is now firmly established with roads and airport. Sheep and cattle and some timber are the economic interests ; a gold rush came to little or nothing.

The book is written from the diaries of Thomas Bridges and the memories of his son Lucas. It is a rambling account of this strange, forgotten land, with no pretence at scientific arrangement or outlook, but it is one of the finest travel books of recent years and will remain a standard work on those disappearing tribes Ona and Tahgan. Illustrations and maps are excellent. R. N. R. B.

## AUSTRALASIA

*The Face of Otago.* Edited by B. J. GARNIER, M.A. 8½×5¼. Pp. ix+82. 12 figs. Frontispiece. 26 photographs. Otago Centenary Publications. Dunedin : Whitcombe and Tombs Ltd., 1948.

It is most satisfactory that the committee responsible for the Otago Centenary Publications should have seen fit to include a geographical volume in the series. The immediate purpose of the book is presumably to portray the geographical background of Otago's history, but the diverse character of the province gives it a far wider interest. It is doubtful whether any other area of the same size can show such an amazing range of climates. The work confines itself to describe the face of New Zealand's southern province, and does not attempt to touch its development by man. The seven chapters are by five different writers.

The book is a useful addition to the library of the general geographer. The photographs are excellent, as are also the maps and diagrams. C. R. V. G.

## POLAR REGIONS

*Eskimo Doctor.* By Aage Gilberg. Translated from the Danish *Verdens Nordligste Læge* (1943) by Karin Elliott. 8½×5½. Pp. 150. 74 photographs. End-paper sketch maps. London : George Allen and Unwin Ltd., 1948. 15*s*.

*Eskimo Doctor* is the story of a year (1938-39) spent by Dr. Aage Gilberg and his wife in the far north-west of Greenland amongst the Polar Eskimo of Thule. The timely establishment of this arctic station by the late Dr. Knud Rasmussen in 1910 probably saved this remnant of a singularly charming race from extinction. Shortly after his death the station was taken over by the Danish Government and Dr. Gilberg was the first doctor sent there under Government auspices. His first-hand story of the childlike, friendly people amongst whom he lived and worked, and whom he learned to love, is one of exceptional charm and interest.

Dr. Gilberg wields the pen of an artist and his enthusiasm for people and country is infectious. He has recaptured in his narrative something of the beauty of life in this arctic Fairyland, which he regards as " the most heavenly place there is." But perhaps it is a mistake to return from Fairyland. " How nasty people are ! I had never noticed that before," remarked Mrs. Gilberg as she walked the streets of Copenhagen in the fatal year 1939. " We were struck," says her husband, " by the unwillingness of people to help each other unless they received money, praise or glory for it, and we noticed how quick everybody was to claim his rights from the community and his fellow-citizens, without realising that he himself should give some service." Readers will endorse Dr. Gilberg's prayer that "This fair unknown land remain forever Danish. We have built up this colony in a spirit of forbearance and unselfishness ; we have earned the right to wish that our flag shall continue to fly here." I. W. H.

*Arctic Unfolding.* Experiences and Observations during a Canadian Airborne Expedition in Northern Ungava, the Northwest Territories, and the Arctic Archipelago. By Nicholas Polunin. 9×6. Pp. 348. 33 plates. 3 sketch maps. London : Hutchinson and Co. (Publishers) Ltd., 1949. 21*s*.

The author of this book, now a Professor of Botany in the University of Montreal, had made several visits to both the European and the American Arctic before he made this air trip to the eastern part of the Canadian Arctic. His chief purpose was to report on possible reindeer pasture, but of this he has little to say, though the book gives a very detailed account of events and country. It is a monotonous country, not made any less so by the diary of the author with his somewhat ingenuous style. There are full references to other books and papers, a most useful feature of the book. Altogether it is a welcome addition to works on the Canadian Arctic, and adds to our knowledge of survey and ecology. R. N. R. B.

*Fifty Years below Zero : A Lifetime of Adventure in the Far North.* By Charles D. Brower. Introduction by Vilhjalmur Stefansson. 8½×5½. Pp. viii+254. 20 illustrations. London : Robert Hale Ltd., n.d. 12*s* 6*d*.

This book would have been improved with a map and an index. For half a century the author was, as V. Stefansson terms him, Uncle Sam's most northerly citizen, living at Cape Barrow because he liked it and preferred it to civilisation. Every part of the Arctic has these polar beachcombers who make a good living and lead a prosperous and often useful life in the frontier regions of human settlement. It is not an exciting book, but rather one filled with the commonplace events of life in the far north, hunting and trading with the Eskimo. It certainly shows that such a life can have its monotony as well as its adventure. R. N. R. B.

*Logbook for Grace : Whaling Brig 'Daisy,' 1912-1913.* By Robert Cushman Murphy. 9½×6. Pp. xi+290. Drawings. London : Robert Hale Ltd., 1948. 15*s*.

Dr. Murphy as a young graduate made a trip to South Georgia on a New Bedford whaler and sealer, and wrote this log for his wife. For some reason it has lain unpublished until now, but is none the less welcome. The sperm whalers are finished, and the hunters of sea-elephants have almost encompassed their own fate : the *Daisy* alone must have accounted for several thousands.

The original log has been edited, curtailed and amended, and now reads as a delightful commentary on the voyage, with a wealth of observations on whales, seals, birds, and other creatures, and with many shrewd comments on whalemen and others. It is a pity that there is no index and that the portrait of the distinguished author is given only on the dust-cover. R. N. R. B.

*Antarctic Posts and Stamps.* By Dr. J. H. Harvey Pirie. 8½×5½. Pp. 71. Illustrated. London : Stamp Collecting Ltd., n.d.

From his early love of geology Dr. Pirie turned to medical research, and now shows his scientific bent in a scholarly study of the stamps and covers that concern the Antarctic. This is no mere stamp collector's list or catalogue of values. It is an exhaustive review of the development of postal communication, often of a temporary nature, of Antarctic lands and islands, including subantarctic islands. Tristan da Cunha and the Falkland Dependencies receive most notice. In this relation there may also be noted the recent paper in the *Polar Record* [Vol. 5, Nos. 33, 34], by R. W. Bagshawe, on Postal History of the Falkland Islands Dependencies.

Dr. Pirie's accurate survey is a valuable contribution to the history of these islands. It is exhaustively illustrated and carefully documented. R. N. R. B.

## CLIMATOLOGY

*Climate Through the Ages :* A Study of the Climatic Factors and their Variations. By C. E. P. Brooks, i.s.o., d.sc., f.r.met.soc. 8½×5½. Pp. 395. 39 figs. London : Ernest Benn Ltd. Revised edition, 1949. 21*s.*

Man, during his geologically brief existence on earth, has never experienced the normal climate of his planet, the genial and uniform conditions that have existed for immensely long periods of time. During his entire history, he has lived in the abnormal climate of an ice age, the last of four, perhaps five, major glaciations that have occurred at intervals of about 250 million years to interrupt for comparatively short periods the normally mild and quiet terrestrial weather.

The reader will find presented in this book, by an author who has himself made valuable contributions in this field, a fascinating account of the various theories proposed to explain the occurrence of these relatively brief periods of climatic upset. The effects of variations in solar radiation, sunspots, water vapour, and carbon dioxide ; the astronomical factors, obliquity of the ecliptic, eccentricity of the orbit, and the precession of the equinoxes ; ocean currents ; continentality ; mountain building ; volcanic dust ; cloudiness ; and floating ice are all examined, and the author finally expresses his conviction, which he amply vindicates, that the dominant factors are geographical.

There is one recurring statement that is likely to confuse the reader : When discussing the effect of clouds on terrestrial radiation, the author invariably states that reflection occurs. This must perplex the student who has been taught that a cloud is a black body radiator and so is a complete absorber of terrestrial radiation, though a very effective reflector of short wave radiation. The general reader may ' make heavy weather ' of the first section of the book, which deals with the underlying meteorological theory, but he would be well advised to persevere. Fairer weather lies beyond the middle paragraph of page 187. In the second section, the theory developed in the first is applied to the problems presented by geological climates. It contains a critical discussion based on climatological evidence of Wegener's hypothesis of continental drift. The third and concluding section presents in detail an account of the climatic fluctuations in different parts of the world during the historical period, *i.e.* from about 5000 b.c.

The first edition of this book was published in 1926 and was discussed at some length by Dr. Marion I. Newbigin in " Ice Ages and the Geological History of Climate " [*S.G.M.*, 1927, 43 (*1*) : 31-40]. The present second edition has been in part extensively rewritten and is likely to remain for a long time a standard text of palaeoclimatology. J. P.

## BIOGEOGRAPHY

*Plant and Animal Geography.* By MARION I. NEWBIGIN, D.SC. (Lond.). Revised by J. H. Fleure. 8½×5½. Pp. xv+298. 39 figs. London : Methuen and Co. Ltd. Second edition, 1948. 16*s*.

The publication of a second edition of this well-known text-book was overdue, and is most welcome. That it is, apart from a very few minor changes, essentially a reprint of the first edition [see *S.G.M.*, 1936, 52 (6) : 405-406] is no less a tribute to the quality of Dr. Newbigin's work than is the appreciation written by Professor Fleure, who undertook the revision of the text after the author's death. The valuable chapters by Miss Margaret Dunlop, on Soils and Soil Study, and on Climatic Changes and their Effect on the Plant Cover, are of course also retained.

The book still remains a favourite introduction to biogeography. J. H. K.

*Gli Animali sulle Terre e negli Oceani :* La distribuzione geografica delle attuali faune continentali, insulari e marine. By GIUSEPPE CEI. 9½×7. Pp. 626. Sketches of animals. 12 photographs. 20 sketch maps. [Scienza e Natura, No. 2.] Firenze : La Nuova Italia Editrice, N.D.

Even when supplemented by sketch maps, a verbal description of the present geographical distribution of animals is a prodigious undertaking. Documentation alone is so voluminous that the author of this remarkable treatise—which emanates from the Zoological Institute of the University of Florence—of necessity could include only a relatively small selected bibliography. After a brief review of faunal distribution in the remote past, there is a discussion of zoogeographical regions, followed by chapters dealing with the fauna of each region and sub-region. In the penultimate chapter is described the distribution of marine animals, while in the final chapter the author enters a strong plea for the conservation of wild life in national parks and nature reserves.

Although many pages are so replete with non-tabulated names of animals that the lucidity of argument and style characteristic of other parts of the book tends to be impaired, the usefulness of this work to the geographer cannot be gainsaid in view of its relative comprehensiveness and the provision of an entirely adequate index. The general reader will be delighted with the numerous sketches of animals—drawn with adept economy of line. More and better maps, however, would seem desirable and are, indeed, essential. J. H. K.

*The Book of Bays.* By WILLIAM BEEBE. 8½×5½. Pp. 240. 33 illustrations. London : John Lane, The Bodley Head Ltd., 1947. 15*s*.

In *The Book of Bays*, the author has written a book combining scientific interest with charm. A fanciful human touch creeps constantly to the fore. The book records an expedition from San Diego, California, to Panama, visiting unfrequented bays and adjacent islands in quest of marine fauna. Mr. Beebe's range, however, is not restricted to the foreshore and upper ocean levels, for deep-sea fish, land mammals, birds, and insects all cross his pages. Works of this kind tend to be tedious to all save the biologist, but *The Book of Bays* is an exception and few will read it without pleasure. The photographic illustrations are of a very high standard. C. R. V. G.

*The Birds of Tropical West Africa.* Vol. VI. By DAVID ARMITAGE BANNERMAN, M.B.E., M.A., SC.D., F.R.S.E. Foreword by Sir Bernard H. Bourdillon, G.C.M.G., K.B.E. 10½×7. Pp. xxxix+364. 62 figs. 14 coloured plates. London : The Crown Agents for the Colonies, 1948. 35*s*.

The sixth volume of this work is well up to the high standard of the preceding ones [see *S.G.M.*, 1938, 54 (*1*) ; 49-50, and 1940, 56 (*2*) : 92] which, when obtainable second-hand, have fetched several times their cost price. Dr. Bannerman has made an exhaustive study of his subject, and his handsome volumes, beautifully printed and produced by an Edinburgh firm, are without doubt the standard work on tropical West African birds. G. W.

## EDUCATIONAL

*Principles and Practice of Geography Teaching.* By H. C. Barnard, M.A., B.LITT., D.LITT. 7×5. Pp. viii+235. 15 figs. London: University Tutorial Press Ltd. Second edition, 1948. 5*s* 6*d*.

The scope and content of modern geography, and its place in education, are outlined efficiently in this practical exposition. General principles and methods are dealt with in considerable detail, and valuable and exhaustive information is given about equipment, aids to teaching, and sources of information and illustration. Schemes of work are discussed, and the School Certificate reviewed from the point of view of an examiner. There is a section on the scope and possibilities of school regional survey, with detailed practical guidance. B. M. W. T.

*Fundamentals in School Geography:* A Book for Teachers and Students in Training. By Olive Garnett, B.A. 7½×5. Pp. 332. 59 figs. London: George G. Harrap and Co. Ltd. New edition revised, 1949. 10*s* 6*d*.

The concern of this book is the establishing of a sound foundation for the scientific study of geography, which it should be possible to commence when the pupil is from nine to twelve years old. The aim of earlier teaching should be to develop powers and abilities, and to provide essential knowledge of implements. To maintain reality, teaching should be confined to matter within the inexperienced imagination of the child, and therefore should be mainly local study and field work. Good practical advice is given on accurate representation of fact. There is an excellent bibliography. B. M. W. T.

*A Student's Introduction to Geology:* Mainly Physical. By George Macdonald Davies. 8½×5½. Pp. vii+175. 175 figs. London: Thomas Murby and Co., 1949. 18*s*.

Printed clearly on pleasing paper and well bound, this little text-book is disappointing. In a disarming preface, brevity and simplification are excused on the grounds that "Few students want to wade through turgid or nebulous writing, or to pay a high price for their books. Accordingly, the matter has been condensed as much as possible without loss of clarity; and the illustrations are limited to figures in the text." The university student, for whom this book is intended, must, alas, acquire a good deal of jargon, geomorphological and geological, in his first year. Oversimplification has not been helped by many of the references to further reading which the student, with only the background of this *Introduction*, will find hard going.

Though most of the text-figures are excellent, a few of the line-drawings of physical features and rocks are poor. At eighteen shillings the book is expensive: with expansion of the text and an increase of some shillings in price, real value would be achieved. A. M. C.

*Physical Geology.* By Chester R. Longwell, Adolph Knopf, and Richard F. Flint. 9×6. Pp. xvii+602. 365 figs. New York: John Wiley and Sons, Inc. London: Chapman and Hall Ltd. Third edition, 1948. $5.00, or 30*s*.

It is a pleasure to welcome the third edition of this standard text-book, whose ancestry goes back to the first volume of Pirsson and Schuchert's *Textbook of Geology* originally published in 1915. No radical changes have been made on the edition of 1939 [ref. *S.G.M.*, 1939, 55 (*5*): 302], but many new and impressive half-tone illustrations, often reproduced from photographs taken from the air, replace older illustrations. The new Chapter 2 introduces the student early to the concept of isostasy, and a brief note on some of the philosophical aspects of geological problems points to Chamberlin's paper on "The Method of Multiple Working Hypotheses." It is difficult to select any part of the volume for special notice, but a personal choice would fall on Chapters 2-13 concerned chiefly with erosion and sedimentation. It is interesting to see modern ideas on granitisation finding their way into a brief appendix to the chapter on metamorphism!

To European readers the weight of the volume may seem excessive—perhaps this is the price to be paid for the reproduction throughout the text of so many beautiful illustrations. A. M. C.

*A Geography of Man.* By PRESTON E. JAMES, with the collaboration of HIBBERD V. B. KLINE, Jr. 9¼×6½. Pp. xvi+632. 239 figs. 27 maps. Bibliography. Boston, Massachusetts : Ginn and Company, 1949. $4.75, or 36*s*.

The author has presented us with another very attractive volume. On page vii he lays down five sound basic concepts round which he has written this book. The land is regarded as neutral, and the human use made of it depends on the cultural stage of the people inhabiting it. If any human society is to survive, it must form a workable connection with the resources of its area. Simple societies on a small base-area form a few simple connections ; the more complex the culture, the greater is the variety of possible connections, and the complex industrial society of to-day must have a base-area of not less than the whole world.

For purposes of detailed study the world is divided into eight major groups of natural regions. Within each region, for example, the Mediterranean scrub forest lands, the author examines each of the constituent areas physically and climatically, and by an examination of the differences in these and of the differences in *sequent occupation*, he brings out differences in economic development, density of population, pattern of settlement, etc. Generally, an advance in the method of living in an area, far from emancipating man from his physical surroundings, makes closer and closer adjustment to these surroundings necessary.

In addition to valuable appendices there is a wealth of excellent maps, diagrams, and pictures. J. Y. E.

*The World's Wealth.* By R. W. BROOKER, M.A. 8×5½. Pp. 236. 95 figs. The Charter Geographies, edited by W. F. MORRIS, B.A. London : George G. Harrap and Co. Ltd., 1949. 6*s*.

This is one of a graded series of text-books suitable for the lower forms of Secondary Schools. It is divided into three sections : The World's Mineral Wealth ; The Living World—Plants and Animals ; Combined Operations—Trade and Transport. The book is well written, with a certain living quality running through it—a quality obtained by studying Man in the Place but also Man in Time. J. Y. E.

*Transport, Trade and Travel Through the Ages.* By R. W. MORRIS, PH.D. 7½×10. Pp. iv+32. Drawings by Dorothy H. Ralphs. Sketch maps by Arthur S. Young. London : George Allen and Unwin Ltd., 1948. School edition, 2*s* 3*d*. Cloth, 3*s* 6*d*.

This little book, well illustrated with maps, pictures and diagrams, shows the development of transport methods from Roman times to the present. The influence of the increase in rate and ease of communications upon the trade and interdependence of different parts of the world is well brought out. Much history and geography could be taught from this attractive book. J. Y. E.

*A Systematic Regional Geography.* Vol. 3. *A World Survey from the Human Aspect.* By J. F. UNSTEAD, M.A., D.SC. 8½×5½. Pp. xii+451. 73 figs. London : University of London Press Ltd., 1948. 15*s*.

Few geographers of his generation have earned for pioneer work in academic geography as much regard as Professor Unstead. His long service helped to lay the foundations of geography in the University of London, and his text-books have met with wide use. Now he crowns his work from a busy retirement with an excellent manual of a " post-matriculation course," based on his wide knowledge and extensive experience.

He is never dull, narrow, or hackneyed in his treatment, and he is generous in his claims for the scope of geography. Physical, cultural, and geographical regions are all considered, the last entailing a synthesis of all the geographical factors and showing a distribution not widely different from the vegetation regions. The seasonal rhythms of each region are noted. Thus Professor Unstead comes very near to writing human ecology. The book deserves a wide use.

R. N. R. B.

*Navigation and Astronomy for Students.* By Ivan E. Allison, A.K.C., F.R.A.S., M.I.N. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. 439. 162 figs. 3 charts. London : George G. Harrap and Co. Ltd., 1948. 25*s*.

This book is intended for students of navigation in technical and nautical schools, the author being a navigation teacher at Grimsby Nautical School. It is, however, more than just a 'guide book' for seamen, as so many navigation text-books are. The introduction to many of the chapters deals with the historical aspect of the subject, especially so in the case of the chapter on the celestial sphere and the constellations. The book is divided into three sections : Terrestrial Navigation, Astronomical Navigation, and Radio Navigation. In each section both sea and air methods of navigation are adequately treated. The diagrams are clear and well executed, while numerous examples for practice appear at the end of each chapter.

The only criticism which might be made is that the attempt to deal adequately with both sea and air methods in one volume tends to lead to a confusion of technical terms and methods, which might add to a student's difficulties in becoming accustomed to technical phraseology. W. A. F.

*The Map that came to Life.* By H. J. Deverson. 9×11. Pp. 32. Drawings by Ronald Lampitt. London : Oxford University Press, 1948. 8*s* 6*d*.

This delightful book does indeed bring maps to life, not only for the age—9 to 12—for which it is designed, but for elders and juniors too. Aided by a 'one-inch' map, a boy and girl set out to find their way across an English countryside to a Market Town, and they discovered what village and town can show. Place by place, we share their delight by help of small map excerpts, enlarged for easy reading, side by side with excellent drawings, concrete, colourful, and 'alive.' A nice and not too 'heavy' uncle tells them more about things they guess for themselves, of past and present. An excellent book. A. G.

## GENERAL

*Les Villes :* Aperçu de géographie humaine. By Georges Chabot. $6\frac{1}{2}\times4\frac{1}{2}$. Pp. 224. 10 figs. Paris : Librairie Armand Colin, 1948. 120 *fr.*

This small book presents in a very competent manner the main aspects of the geographical study of towns. The first part is devoted to a study of function, illustrated by reference to military, commercial, industrial and other types of towns. Town morphology is considered in the second part and finally, in part three, broader aspects of town distributions are discussed. The importance of town studies is brought home to the general reader as well as to the professional geographer by a map showing that more than 40 per cent. of the population of Great Britain lives in towns of 100,000 inhabitants or more. The general conclusions should evoke interesting discussion. The serious food situation to which large town populations subscribe is clearly recognised. On the other hand, however, towns are seen as the generators of new ways of life and as the vanguard of civilisation. In many of its elements, the town civilisation of to-day is seen by the author to be the rural civilisation of to-morrow. The text is both compact and clear, and the wealth of examples testifies to the author's thorough knowledge of his subject, which made possible such a relatively short but thorough book. S. J. J.

*The Story of the Bridge.* By F. W. Robins. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. v+278. 73 photographs. Birmingham : Cornish Brothers Ltd., n.d. 30*s*.

This book brings together in an interesting manner a great deal of information concerning bridges. The subject is treated in terms of the development of bridge construction in this country, and covers everything from fords and clapper bridges to London Bridge. Linked with this theme is a discussion of the bridges of non-European peoples. This helps to give perspective to the problems discussed, as can be seen in the short chapters on suspension and cantilever bridges. The world distribution of different types of bridges is a subject which should be pursued still further. S. J. J.

*The Year Book of World Affairs 1949.* Edited by GEORGE W. KEETON and GEORG SCHWARZENBERGER. 10×6¼. Pp. viii+342. London: Stevens and Sons Ltd., 1949. 20*s.*

Published under the auspices of The London Institute of World Affairs, this year book gives a conspectus of international relations and of sociological, economic, psychological and educational, legal, and institutional aspects of world affairs. The greater part of the book contains essays or reviews, by different well-known specialists, dealing with The Study of International Relations, The Future of the British Colonial Empire, India—since Independence Day, The Middle Way in France, Eastern Europe, Recent Developments in Inter-American Relations, Basic Problems in Modern China, Palestine and the United Nations, The 'Little Assembly,' The International Court of Justice, Soviet Participation in International Institutions, and Conflict of Sovereignties in the Antarctic.

To these are added the reports on the different aspects of world affairs, each headed by a list of references to relevant current books. A satisfactory index adds to the value of the *Year Book* for study and reference. J. H. K.

*L'espansione inglese* (*I Dominions*). By GIUSEPPE DE' LUIGI. 8¾×6½. Pp. 409. Napoli: Libreria Scientifica Editrice, 1948.

This is a straightforward account of the history of the British colonies of settlement and their evolution into the Dominions. The volume should prove a very useful historical introduction for Italian readers seeking to understand the political relationships within the Commonwealth. C. J. R.

*America's Colonial Record.* By JOHN COLLIER. 8½×5½. Pp. 36. [Fabian Colonial Bureau Research Series No. 119.] London: Fabian Publications Ltd., and Victor Gollancz Ltd., 1947. 1*s.*

The pattern of American expansion is discussed by the President of the Institute of Ethnic Affairs, who regards the more sympathetic attitude towards the American dependencies shown on the political rather than on the economic side as reflecting the prevailing economic attitude in the United States. The most obvious deficiency in handling colonial affairs would appear to be the absence of any single responsible Federal agency. Some sixty references are included in the pamphlet. J. H. K.

*Christopher Columbus.* Being the Life of the Very Magnificent Lord Don Cristobal Colón. By SALVADOR DE MADARIAGA. 8½×5½. Pp. xi+498. 4 illustrations. 3 maps. London: Hollis and Carter Ltd. New edition, 1949. 18*s.*

This is a second edition of the scholarly work first published in 1939, brought up to date by an extensive note. The book is as much an attempt to delineate the character of the almost 'unknown' discoverer of the New World as a narrative of events. Much space is devoted to seeking to solve the riddle of Columbus' origin. The author's conclusions are that he was of Jewish blood and that his family migrated to Genoa from Catalonia about a century before his birth. The character of Columbus as drawn is not attractive, although some of the defects are shared with our own Elizabethans. The underlying patriotism of the Devon seaman, however, has no equivalent in the make-up of the Genoese navigator, whose sole driving-force appears to have been advancement of self. As an administrator, Christopher Columbus proved a failure.

The book contains two very interesting maps. One gives Columbus' conception of the eastern coast of Asia compared with the actual position and outline of the Americas. The second illustrates his utilisation of the winds and currents on his First Voyage. C. R. V. G.

*Isles of Romance and Mystery.* By GORDON COOPER. 8½×5½. Pp. 180. 40 photographs. London: Lutterworth Press, 1949. 12*s* 6*d.*

The islands of this book have nothing in common except their insularity, but islands have a fascination for the author, and so he treats us to some of his collection. He has been fortunate in his range of visits, from Spitsbergen to Tristan da Cunha,

Pitcairn to the Galápagos, and from Haiti to the Aaland Islands—fifteen or more islands and island groups. About each he writes of the people, history, and scenery with accuracy, conciseness, and an appreciation of the problems involved. There is nothing new in the book, so far as we can judge, but there is a balanced choice of the most interesting matter available. The photographs, however, are chaotically strewn with no regard to the letterpress. R. N. R. B.

## MAPS AND ATLASES

*Johnston's Premier Atlas of the World.* 11×8½. Pp. 48 (coloured maps)+48 (general index). Edinburgh : W. and A. K. Johnston Ltd., 1948. 10*s* 6*d*.

Not intended for use in school or college, this inexpensive reference atlas will enable the unsophisticated 'man in the street' to alleviate his curiosity as to the location of many places, political boundaries, and physical features mentioned in the news. Britain overseas receives special consideration. The comparative times at different places in the world are shown by means of clock diagrams, and the gazetteer is adequate to the atlas. J. H. K.

*Kulturgeografisk Atlas.* By JOHANNES HUMLUM. 12¼×9¼. Pp. 124. 110 maps. Diagrams. Photographs. Copenhagen : Gyldendalske Boghandel Nordisk Forlag. Second edition, 1947. *Kr.* 16.65.

This very useful atlas of economic geography, compiled by Professor Johannes Humlum of the Geographical Institute, Aarhus University, contains maps of population, food and raw material production and trade, metallurgical industry and water-power. Production is indicated by countries in both figures and proportionate circles. The world maps are on Kayser's projection, and for most products there is an inset map of Europe on a larger scale. The data are mostly for 1936-38 or 1938. A number of the maps give poleward limits of production. They are usually accompanied by figures of total world production and trade. Alternate pages are occupied by articles providing useful summaries of the economic geography of the various products and illustrated with small maps of important producing areas and with photographs—generally taken by the author. The table of contents is given in both Danish and English. C. J. R.

*The Harold Whitaker Collection of County Atlases, Road-Books and Maps presented to the University of Leeds.* A Catalogue by HAROLD WHITAKER, HON.PH.D.(LEEDS). Introduction by Richard Offor. 10×7½. Pp. 143. 10 illustrations. Leeds : The Brotherton Library, 1947. 10*s* 6*d*.

The atlases, maps, and road-books collected by the author—an authority on English county cartography—over a period of some thirty years are here catalogued with explanatory notes. The items are arranged in chronological order, from Christopher Saxton's atlas (1579) to modern atlases of the British Isles. Road-books, maps of Yorkshire, miscellaneous maps or volumes containing maps of the British Isles, general and foreign atlases in the collection, and references are listed in appendices. Each item has a reference number, and some reference numbers in Thomas Chubb's *Printed Maps in the Atlases of Great Britain and Ireland* and in *A List of Geographical Atlases in the Library of Congress* are also given. Illustrations of some rare or curious maps add to the value of this well produced volume. J. H. K.

*Höjdekort over Danmark.* 1 : 250,000. 4 sheets, each 34×30½.

*Landskabskort over Danmark.* 1 : 250,000. 4 sheets, each 34×30½. Copenhagen : Geodætisk Institut, 1947.

The relief map of Denmark contains very much information without being overcrowded. Relief is shown by contours and coloured layering—green, yellow and brown, roads and railways in unobtrusive dull brownish red, and the shape of towns in bright red. Sands, the main marsh, meadow and moor lands, and coniferous and deciduous forests are indicated by symbols. Lighthouses and lightships, churches, power stations, airfields, brickworks, ruins, etc., are also shown. The population of settlements is indicated by style and size of lettering. There are

inset maps of Denmark's administrative divisions ; Copenhagen and environs (1 : 100,000)—showing the growth of the city ; the Faeroes (1 : 250,000) ; and Greenland (1 : 4,500,000).

On the landscape map, prepared by the Geodætisk Institut in collaboration with the University, and partly based on maps by the Danish Geological Survey, the morphology of the country is clearly shown in twenty colours and by means of symbols. The clarity of the map is not disturbed by contours, relief being indicated by spot heights only, apart from that inferred from the colour symbols, such as for the marine foreland, dunes, cliffs, and glacial and postglacial features. Towns, roads, and railways are shown as on the relief map. An inset map of the Faeroes shows peaks and plateaux, corries and screes, peneplain remnants, valleys eroded by ice, and other features. Another inset (1 : 650,000) gives a clear picture of the furthermost limit of glaciation in Denmark and of the relatively brief or prolonged stages in the withdrawal of the ice front.

Both these maps are very well produced, and the four sheets of each can be mounted together to form exceptionally good wall-maps. J. H. K.

*Carte de la végétation de la Suisse. Vegetationskarte der Schweiz.* Scale 1 : 200,000. By Emil Schmid. Sheet No. 2 : *Lucerne-Zurich-St.-Gall-Coire.* Sheet No. 4 : *Gothard-Tessin-Grisons.* Issued by La Commission phytogéographique de la Société helvétique des Sciences naturelles. Printed by Kümmerly und Frey, Bern. Bern : Hans Huber, [1948].

This fine map of Switzerland is issued by the Swiss Society of Natural Sciences, in which geographical method holds a recognised place. The base map is contoured and named in grey, the streams shown in a bold blue. Upon this are shown in colour eleven zones or types of vegetation, local dominance of any one of twenty-three arboreal species being distinguished by an overprinted symbol—easily learned. In addition, five associated types of land use—cultivation, vineyards, hayfields, peaty meadow, and hill pastures—are shown by familiar stipples in the colour associated with the zone, if found there. The key being in French and German, with Latin, is useful to all.

The result is not only pleasing but such as to present a picture of the whole country at a distance : the main beech zone of the northern lowlands—above the valley zone of oak and lime ; the spruce, larch, and alpine meadow zones girdling the mountains ; and the oak (*Quercus robur*)-and-heath zone above its vineyards, in the south. Yet in detail, by help of common-sense map-reading, one can visualise a given habitat or site with its vegetation and use : a stream-valley or a ridge ; a sunward or a shadowed slope ; vineyard, ploughland, or grass. Altogether, a remarkable map. A. G.

*Map of Poland and Adjacent Countries.* Edited by Dr. B. Zaborski. 1 : 1,100,000. London : Association of Polish University Professors and Lecturers in Great Britain, 1948.

Printed in London by George Philip and Son Ltd., this coloured map is based on the operational maps (1 : 300,000) issued by the Military Geographical Institute, Warsaw, during 1921-1939, on the physical and administrative map edited by the Geographical Section of the Polish General Staff (Edinburgh, 1943), and on other sources. Polish names in Saxony, Silesia, Brandenburg, Pomerania, and East Prussia were compiled by W. Palucki, M.A.

Relief is indicated by colouring, without contour lines. Hydrological features, including the symbol for spas, are shown in blue, towns and railways in red, and boundaries in violet. For general purposes this is quite a useful wall-map.

J. H. K.

*Bartholomew's General Map of North America.* 1 : 10,000,000. Edinburgh and London : John Bartholomew and Son Ltd., N.D. Mounted on cloth, 6*s* 6*d*.

Included also in this coloured topographical map are Greenland, Central America, and the West Indies. Railways and steamer routes are clearly shown, and much other information is most adequately provided without overcrowding. J. H. K.

## INTERNATIONAL GEOGRAPHICAL UNION

A provisional programme of work for the Commission on Industrial Ports was prepared and circulated before the meetings in Lisbon in April 1949 [cf. *S.G.M.*, 65 (2) : 66]. The Commission held two meetings, one to discuss details of research to be undertaken, the other to receive and consider papers already contributed.

As a result of these and earlier meetings, two main decisions were reached. It was agreed that the Commission should present a report, together with certain papers on different aspects of the geography of industrial ports, for publication by the International Geographical Union. The second decision concerned actual types of research, as certain questions are of special importance and demanding particular investigation.

Members of the Commission hope that workers in this field will give special attention to factors influencing the location of industries within a port, and to the extent to which the hinterland of a port is influenced by the industries of that port. If attention can be focussed on one or other of these topics, it is probable that the facts applicable to different ports may well allow the establishment of certain principles.

The Commission will be interested to know of work completed or being done, and those geographers concerned are asked to make contact with either the Chairman of the Commission, Professor W. E. Boerman, van Beuningenstraat 18c, Rotterdam, Netherlands, or the Secretary, Professor G. H. J. Daysh, Department of Geography, King's College, Newcastle-upon-Tyne 1, England.

## INTER-UNIVERSITY GEOGRAPHY CONFERENCE

The students of the Department of Geography, Birmingham University, are organising an Inter-University Geography Conference, to be held at the University, 17th to 21st April 1950.

This is an attempt to bring students of geography together from all parts of the United Kingdom, to broaden their interest in the subject by talk and discussion, and also to permit of social contact. It is hoped that the conference will become an annual event to which students of geography will contribute the major part. But all students, of whatever faculty, are invited.

A civic reception has been kindly arranged by the Lord Mayor of Birmingham. Provisional speakers are Sir Raymond Priestley, Sir E. John Russell, Professor R. H. Kinvig, Mr. M. J. Wise, and Mr. H. J. Manzoni. It is hoped that Professor Griffith Taylor and other geographers may also be present.

The cost—including accommodation, meals, and attendance at lectures—is hoped to be not more than £3, 10*s*. Further information may be obtained from Mr. J. N. Jackson, Inter-University Geography Conference, 341 Bristol Road, Birmingham 5.

# ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

## PROCEEDINGS

At its Meeting held on 1st March 1949, Council invited the following to become Honorary Fellows (Foreign) of the Society :—

| | |
|---|---|
| Hans W:son Ahlmann | Professor, University of Stockholm. |
| André Allix | Rector, University of Lyons. |
| Henri Baulig | Professor, University of Strasbourg. |
| Renato Biasutti | Professor, University of Florence. |
| Willem Everhard Boerman | Professor, University of Rotterdam. |
| George B. Cressey | Professor, University of Syracuse, U.S.A. |
| Mlle. Marguerite A. Lefèvre | Professor, University of Louvain. |
| Niels Nielsen | Professor, University of Copenhagen. |
| Carl O. Sauer | Professor, University of California. |
| Johann Sölch | Professor, University of Vienna. |
| Maximilien Sorre | Professor, University of Paris. |
| John K. Wright | Director, American Geographical Society, of New York. |

And Council now have the honour to report that all the above distinguished geographers have accepted the Diploma of Fellowship.

Meetings of Council were held on 18th October and 29th November 1949.

## BEQUEST AND DONATION

The Society is indebted to the late Miss Ida M. Hayward, F.L.S., of Galashiels—a valued Member and well known as a botanist, author, and lecturer on aspects of Tweeddale and the Borders—for the following bequest: The sum of £50 and "coloured cine-films with projector and two silver screens; films of S. African Voyage—four boxes, and one film 'The Borderland, or Homes and Haunts of Sir Walter Scott'—four boxes. 'The Seasons in the Borders'—four boxes, and a smaller film of the celebrations in St. Andrews in 1937 to be made available for the benefit of Scotland generally."

The receipt of a gift, from an anonymous donor, of £10 to the funds of the Society is likewise gratefully acknowledged.

## ANNUAL GENERAL MEETING

The Annual General Meeting was held in the Society's Rooms in Edinburgh, 4th October 1949, the President in the Chair.

The Annual Report of the Council and the Financial Statement were unanimously adopted.

It was also unanimously approved that Article 22 of the Constitution and Laws of the Society should read as follows:—

> "22. The official year of the Society shall extend from 1st October to 30th September. The financial year shall be determined by Council."

The following members of the Society were unanimously elected to be—

(*a*) President and Chairman of Council:—Professor Alan G. Ogilvie, for an extended period of one year in accordance with Article 15 of the Constitution and Laws of the Society.

(*b*) Members of Council:—Edward Wyllie Fenton; Harold Skelton; James Y. Erskine; Ronald Miller; Colonel R. Hay; Archibald Haldane; J. G. Harley; Sir Tennant Sloan; D. R. McGregor; Miss F. Kennedy; Arthur R. Wannop; W. L. Christie; Rev. John W. Arthur; John Bewsey.

(*c*) Vice-Presidents serving on Council:—Douglas A. Allan; Roland E. Cooper; Douglas Guthrie; Rev. Archibald E. Robertson; Arthur W. Russell; Principal J. Cameron Smail.

(*d*) Chairmen of Branches:—*Glasgow:* John Johnston; *Dundee:* John Watson; *Aberdeen:* William Clark Souter.

The other Office-bearers were re-appointed.

The President concluded the meeting with the following remarks:—

The occasion seems appropriate for some reflection upon geographical societies in general, and this Society in particular. Most of the so-called learned societies consist of people who are professionally engaged in the subject to which their societies are devoted. In addition, there are many associations of people who join as amateurs in specialised studies that form their secondary interests, their hobbies in fact; I refer to such bodies as the excellent field clubs and local antiquarian societies. But the geographical societies do not quite fit into either category, since they have always consciously embraced both; and, I think, with very good and important results on the whole. Most geographical societies were founded in the days of pioneer exploration, and the large memberships they attained bear witness to the keen interest that was displayed in these by all sorts of people who, by their support, enabled the explorers to expand their field of work.

These days are over; but instead there has arisen a large body of professional geographers in many countries who are contributing to knowledge both by their own

observations throughout the world and by their systematic co-ordination of those of others.

Now it is these geographers who have the responsibility of maintaining and developing the subject which has been laboriously built up during the past century. This is their first duty, but they have another. Geography differs from all other disciplines in the vast range of material upon which it draws and in its special concern with the interaction of man with the terrestrial environment. It is therefore very important that as many people as possible be informed of the geographers' findings, because their discoveries always have some bearing upon the life of communities, and they ought to have much more effect than they do on the way of life of all peoples. It is therefore, in my view, incumbent on geographers to tell the world, *i.e.* to practise what the French call *vulgarisation*, so that the applications of the geographical approach to practical affairs may be widely appreciated. For this the geographical societies provide some of the means : by their lectures, publications and opportunities for informed discussion. Many of the members too, who are not themselves geographers, should be able to contribute to a geographical topic under discussion from their own special knowledge, perhaps, *e.g.* of some basic science, or of a commodity of trade, or of the mode of life of some foreign people.

Now to turn to our own Society ; the geographers and others who lecture to us from time to time and those who send us contributions to our *Magazine* bring some of the results of their work and experience to the knowledge of our members, and of course by publication, to other geographers. But it seems to me that the majority of the members play a rather too passive role. I would suggest that they consider whether, as members, they ought to look for something from geography which bears specially on their duties and privileges as citizens, something, I mean, of which they should have a better grasp than other citizens who are without this advantage.

There can be no doubt that in regard to Scotland our members are already in this position. The stream of papers we have published on the geography of our own country must surely have given the readers a fuller understanding of Scotland, and so made them more able to influence the conduct of her affairs. But think of the special responsibilities of British citizens overseas. The Dominions, with which Scottish people have so many ties, manage their own affairs ; but the fate of the Colonies depends upon our Parliament. You and I therefore have direct responsibility for some forty different lands and their peoples, scattered over the world. Every one of them has important and difficult problems to solve, economic, social and political. Now it is a sad reflection that the vast majority of our people possess only the sketchiest knowledge of these extremely varied territories ; and I suggest that it is the duty, as it should be the wish, of the members of our Society to try to ensure that they are able at least to inform their friends and perhaps to question their Members of Parliament on the matters that arise in relation to Colonial affairs. I should therefore be happy if the members were to indicate a desire for greater and more systematic attention by the Society to the British Colonies and Dependencies.

I have taken this suggestion as an example ; there are doubtless other geographical subjects in which many of our members would have some special interest. And I put the suggestion not to the Council in the first instance, but to the members, because I feel that the Council ought to receive more help from them in regard to the activities of the Society.

## LECTURE SESSION, 1949-1950

### JANUARY–MARCH, 1950

### EDINBURGH, *Usher Hall*

EVENING MEETINGS—Thursdays, at 7.30 P.M.

| | | |
|---|---|---|
| January | 19th. | Sir ANDREW G. CLOW, K.C.S.I., C.I.E., M.A., on "Assam." Illustrated. |
| February | 16th. | Surg. Commander G. MURRAY LEVICK, F.R.G.S., F.Z.S., R.N. (retired), on "The British Schoolboys Exploration Society's Expedition to Northern Quebec." Illustrated. |
| March | 16th. | JOHN BARTHOLOMEW, M.C., M.A., F.R.S.E., on "The Grand Canyon of Colorado." Illustrated. |

*Central Hall, Tollcross*

AFTERNOON MEETINGS—Wednesdays, at 3 P.M.

January 11th. PEGGIE M. HOBSON, B.Sc., on "The Islands of Scotland." Illustrated.
January 25th. R. PIDDINGTON, M.A., PH.D., on "Australian Aboriginal Life." Illustrated.
February 8th. JAMES D. BOYD, on "The River Clyde—its History and Effect on the Clyde Valley." Illustrated.
February 22nd. CATHERINE SNODGRASS, M.A., PH.D., on "Kiev, Odessa and Transcaucasia—1937." Illustrated.
March 8th. E. WYLLIE FENTON, M.A., D.SC., F.R.S.E., on "Aspects of Man's Influence on the Vegetation of Scotland." Illustrated.
March 22nd. GEORGE P. BANKS, on "Hydro-Electric Development—New Highland Patterns." Illustrated.

EVENING MEETING—Wednesday, at 7.30 P.M.

March 15th. JEAN GOTTMAN, on "Geography at the U.N.O."

*The Society's Rooms, Synod Hall*

TECHNICAL PAPERS

Fridays, at 5 P.M.

January 13th. SYDNEY F. COLLINS, M.A., on "Coloured Communities in Britain."
February 10th. R. L. SCARLETT, O.B.E., C.D.A., on "Market Gardening in the Lothians: Geographical Influences in its Development."
March 10th. DOUGLAS A. ALLAN, D.SC., PH.D., F.R.S.E., on "Folk Museums as an Aid to the Study of Geography."
March 31st. D. K. PLUMSTEAD, on "The Town Planning of the New Edinburgh."

JUNIOR TALKS

Tuesdays, at 7.30 P.M.

January 17th. JAMES HOSSACK, M.A., B.COM., on "New Scottish Films." Illustrated.
February 9th. (Thursday) DOUGLAS A. ALLAN, D.SC., PH.D., F.R.S.E., on "Scenery of Scotland." Illustrated.
March 21st. JAMES PATON, M.A., B.SC., on "Light and Colour in the Sky." Illustrated.

## DISCUSSIONS

Discussions on Present-Day Problems in their Geographical Aspect have been discontinued.

GLASGOW, *Lyric Theatre*, at 7.30 P.M.

January 18th. Sir ANDREW G. CLOW, K.C.S.I., C.I.E., M.A., on "Assam." Illustrated.
February 15th. Surg. Commander G. MURRAY LEVICK, F.R.G.S., F.Z.S., R.N. (retired), on "The British Schoolboys Exploration Society's Expedition to Northern Quebec." Illustrated.
March 20th. JOHN BARTHOLOMEW, M.C., M.A., F.R.S.E., on "The Grand Canyon of Colorado." Illustrated.

ABERDEEN, *Y.M.C.A. Hall*, at 7.45 P.M.

January 17th. PATRICK W. R. PETRIE, O.B.E., M.B., CH.B., on "Yemen." Illustrated.

February 21st. Douglas Guthrie, M.D., F.R.C.S.Edin., on "Peru, Guatemala and Mexico." Illustrated.
March 14th. John Bartholomew, M.C., on "The Grand Canyon of Colorado." Illustrated.

DUNDEE, *Training College, Park Place*, at 7.30 P.M.

January 18th. Patrick W. R. Petrie, O.B.E., M.B., Ch.B., on "Yemen." Illustrated.
February 22nd. Douglas Guthrie, M.D., F.R.C.S.Edin., on "Peru, Guatemala and Mexico." Illustrated.
March 15th. John Bartholomew, M.C., M.A., F.R.S.E., on "The Grand Canyon of Colorado." Illustrated.

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# ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

## REPORT OF COUNCIL

### Sixty-fifth Session, 1948-49

### (*1st July 1948 to 30th June 1949*)

The Council have the honour to submit the following Report :—

#### Membership

The changes during the Session are as follows :—

| | | |
|---|---|---|
| On the Roll at 1st July 1948 | | 1841 |
| New Members—including 20 Hon. Members | | 537 |
| | | 2378 |
| Deduct by Death | 42 | |
| „ Resignation | 277 | |
| | | 319 |
| On the Roll at 30th June 1949 | | 2059 |

In order that Members can see at a glance the fluctuations in the different categories of Membership at the four Centres of the Society, the total Membership is analysed thus :—

| *Edinburgh* | *30/6/48* | *30/6/49* | *Glasgow* | *13/6/48* | *30/6/49* |
|---|---|---|---|---|---|
| Ordinary | 846 | 973 | Ordinary | 371 | 337 |
| Associate | 86 | 110 | Associate | — | 1 |
| Life | 190 | 221 | Life | 20 | 22 |
| Corporate (Schools) | 13 | 16 | Corporate (Schools) | 26 | 26 |
| *Aberdeen* | | | Y.M.C.A. (10s. Members) | — | 20 |
| Ordinary | 82 | 124 | | | |
| Life | 4 | 5 | | | |
| Corporate (Schools) | 1 | 1 | *Dundee* | | |
| | | | Ordinary | 54 | 43 |
| *Outside Area Members* | 139 | 133 | Life | 2 | 2 |
| | | | Corporate (Schools) | 2 | 1 |
| *Honorary Members* | 5 | 24 | | | |

During the year the Council has re-established contact with distinguished foreign geographers, and laid the foundation of a Junior Membership which will be inaugurated in the coming (1949-50) Session.

### Medal Awards

The Society's Research Medal was awarded to Professor Alexander Stevens, M.A., B.SC., Glasgow, for his published contributions to geographical science and particularly to the geography of Scotland, and for his promotion of studies by others.

The Mungo Park Medal was awarded to Mrs. Mary G. Henry, Pennsylvania, U.S.A., in recognition of her contributions to geographical knowledge by her explorations of Northern British Columbia in 1931 to 1935.

The Scottish Universities Medal was awarded to :—George S. Peters, First Place, General Classes, 1948-49, University College, Dundee, St. Andrews University ; Albert G. Choyce, for distinguished work in the Junior Honours Class, 1948-49, Glasgow University ; Charles Martin Reith, for distinguished work in the Ordinary Class, 1948-49, Aberdeen University ; Miss Hilary M. Donald, for General Excellence throughout the Honours Course, Edinburgh University.

### Meetings of the Society

The Society held forty-nine Meetings during the Session. In Edinburgh : six Lectures in the Usher Hall ; ten Wednesday Afternoon Lectures in the Central Hall, Tollcross ; one Special Lecture in the Central Hall, Tollcross ; seven Technical Papers and five Discussions in the Society's Rooms ; and two Film Shows for Young People in the Synod Hall.

Six Lectures were held in the Lyric Theatre, Glasgow ; six in the School of Economics Lecture Hall, Dundee ; and six in the Y.M.C.A. Hall, Aberdeen. Lectures are currently listed in the *S.G.M.*

### Library and Map Department

The development of Room 31 for the storage of maps, charts and books has been completed by the installation of one large map rack and three (double-sided) sets of book shelving. With the acquisition of these racks and shelving, the herculean and necessary task of rearranging, indexing and cataloguing the Society's maps and books has commenced, as visitors to the Rooms have doubtless realised.

The following additions were made :—229 books ; 16 reports and 49 pamphlets ; 25 books were presented and 27 purchased. The free issue of G.S.G.S. publications has enriched the Society's map collection with approximately 21,480 maps to date.

During the session 3636 books, 314 map and chart sheets, and 112 lantern slides were issued to members.

The Council desire to thank all those who have so kindly supported the Society with the presentation of books, maps, charts and lantern slides. We are indebted to the Pilgrim Trust for a grant of £120 to cover the cost of binding periodicals.

### The Scottish Geographical Magazine

The Council desire to record their appreciation of current geographical publications received from authors and publishers, and their obligations to the contributors of articles and to all those who have assisted the work of the Editors by contributing reviews and in other ways.

Acknowledgment is also due to the Carnegie Trust for grants made to authors towards cost of illustrating individual research papers.

### Donations

During the year a further sum of £1813, 14s. 6d. has been received from the Trustees of the late Ralph Richardson, W.S., a former Honorary Secretary of the Society, under whose Will the Society has now received £27,503, 10s. 1d. bequeathed to the General Funds of the Society. A further sum will be received when the Estate is wound up.

The Society has received a Grant of £120 from the Pilgrim Trust towards the expense of binding periodicals, etc., which work of necessity had fallen into arrear owing to the war.

The other Donations to the General Funds of the Society, received during the year, amounted to £292, 8s. 2d., of which the following were made under covenant :—Dr. James Watt's Trustees, £100; "Anonymous," £90, 18s. 2d. The late Miss I. R. Christie bequeathed a legacy of £100 free of duty along with books, maps, etc.

### The Society's Representatives

The following Members were appointed to represent the Society :—

*Association for the Preservation of Rural Scotland.*—Rev. Archibald E. Robertson, F.R.S.E.

*Scottish Council for National Parks.*—Lt.-Col. Gordon Dalyell of the Binns.

*Bruce Memorial Prize Committee.*—James M. Wordie ; Prof. R. N. Rudmose Brown.

*Carnegie United Kingdom Trust : General Council of the Central Library for Students.*—Robert R. Walls.

*Joint Committee for Anthropological Research and Training.*—Robert Kerr.

*National Committee for Geography.*—Professor Alan G. Ogilvie.

*National Trust for Scotland.*—Professor Alan G. Ogilvie.

*Permanent Committee on Geographical Names.*—John Bartholomew.

*Scottish National Memorial to David Livingstone.*—Lt.-Col. John Johnston.

*National Institute of Oceanography.*—Professor Alan G. Ogilvie.

### Obituary

It is with deep regret the Council record the loss to the Society of 42 Members by death, among them Miss Isabella R. Christie, F.R.S.G.S., a Vice-President and past Member of Council ; Sir Thomas B. Whitson, LL.D., C.A., a past Treasurer ; Sir Iain Colquhoun, a Vice-President ; William Mair, F.R.S.E., F.R.S.G.S., a past Member of Council.

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## NEWBIGIN PRIZE : 1950 AWARD

A Bronze Medal and Money Prize will be awarded for the best Essay, suitable for publication in *The Scottish Geographical Magazine* and not exceeding 7000 words in length, on any subject relating to the geography of Scotland.

Essays, typed and with any illustrations suitable for reproduction, in envelopes marked "Newbigin Prize," must be lodged with the Secretary, Royal Scottish Geographical Society, Synod Hall, Edinburgh 1, on or before October 31st 1950.

## NOTICE

Although the response to previous appeals for spare copies of *The Scottish Geographical Magazine* has been gratifying, copies of issues now out of stock and bound volumes are still very urgently required for the completion of sets.

All bound volumes are acceptable, and also the following numbers :—

Vol. **2**, No. 3 ; **13**, No. 11 ; **20**, Nos. 1, 5, 6, 7 ; **22**, No. 6 ; **25**, No. 8 ; **26**, No. 3; **34**, Nos. 3, 4, 5, 6, 7, 9, 10, 12 ; **35**, Nos. 1, 2, 3, 4, 5, 8, 9 ; **36**, Nos. 1, 4 ; **37**, Nos. 1, 2, 4 ; **40**, Nos. 2, 3 ; **41**, Nos. 1, 2, 6 ; **47**, No. 6 ; **52**, No. 6 ; **58**, Nos. 1, 2, 3 ; **59**, Nos. 1, 2, 3 ; **60**, No. 2 ; **61**, No. 2 ; **62**, No. 3.

It would be much appreciated if such copies of volumes and of separate numbers be handed or sent to the Secretary.

# ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

## ORDINARY REVENUE AND EXPENDITURE ACCOUNT

### For Year to 30th June 1949

#### REVENUE

| | | | |
|---|---|---|---|
| SUBSCRIPTIONS :— | | | |
| Ordinary | | £2,172 11 8 | |
| Schools Corporate | | 120 7 6 | |
| | | £2,292 19 2 | |
| LIFE MEMBERSHIP FEES :— | | | |
| Portion applicable to Revenue | | 102 6 10 | |
| GOVERNMENT GRANT | | 200 0 0 | |
| GENERAL DONATIONS | | 192 8 2 | |
| | | £2,787 14 2 | |
| DIVIDENDS AND INTERESTS | £871 1 11 | | |
| *Less*—Provision for Amortisation | 50 0 0 | | |
| | | 821 1 11 | |
| | | £3,608 16 1 | |

#### EXPENDITURE

| | | | |
|---|---|---|---|
| MAGAZINE—Expenses of Publications :— | | | |
| Printing | | £556 3 7 | |
| Editor | | 85 0 0 | |
| Illustrations | | 252 14 8 | |
| Wrappers, Index and Miscellaneous | | 56 8 2 | |
| Postages | | 69 7 7 | |
| | | £1,019 14 0 | |
| *Less*—Current Magazines sold | £186 6 0 | | |
| Advertisements | 60 10 0 | | |
| | | 246 16 0 | |
| | | £772 18 0 | |
| ROOMS—Upkeep of :— | | | |
| Rent, Rates and Insurance | £220 14 10 | | |
| Cleaning and Repairs | 78 10 11 | | |
| Heating and Lighting | 46 18 4 | | |
| | £346 4 1 | | |
| *Less*—Donations | 98 12 6 | | |
| | | 247 11 7 | |
| LECTURES | £714 12 10 | | |
| *Less*—Received for Tickets sold | 283 5 6 | | |
| | | 431 7 4 | |
| SALARIES | | 1,252 0 10 | |
| AUDITOR'S FEE | | 15 15 0 | |
| SUPERANNUATION CONTRIBUTIONS | | 5 0 0 | |
| LIBRARY—Books, Maps and Furnishings | | 258 2 3 | |
| PROVISION FOR CURRENT AND DEFERRED EXPENDITURE | | 100 0 0 | |
| GENERAL PRINTING | | 153 2 9 | |
| STATIONERY | | 89 8 5 | |
| TELEPHONE AND TELEGRAPHIC ADDRESS | | 32 3 5 | |
| ADDRESSOGRAPH | | 17 16 2 | |
| MEDALS | | 24 12 0 | |
| POSTAGES | | 132 9 7 | |
| MISCELLANEOUS | | 143 14 11 | |
| | | £3676 2 3 | |
| *Less* Deficit for year | | 67 6 2 | |
| | | £3,608 16 1 | |

## BALANCE SHEET as at 30th June 1949

#### ASSETS

| | | | |
|---|---|---|---|
| I. INVESTMENTS :— | | | |
| £400 3% Defence Bonds | | £400 0 0 | |
| £850 2½% do. | | 850 0 0 | |
| £5,000 2½% National War Bonds 1952-54 | | 5,116 8 6 | |
| £5,000 do. do. 1954-56 | | 5,114 17 3 | |
| £2,500 3% National Defence Loans 1954-58 | | 2,613 2 0 | |
| £2,000 3% War Loan 1955-59 | | 2,100 8 0 | |
| £5,000 3% Savings Bonds 1955-65 | | 5,166 8 6 | |
| £4,106, 3s. 3d. do. 1965-75 | | 4,173 17 4 | |
| £5,500 3½% Conversion Stock 1961 | | 5,772 13 6 | |
| £890 2¾% Guaranteed Land Stock | | 500 13 6 | |
| £2,113, 18s. 8d. British Gas 3% Guaranteed Stock 1990-95 | | 2,119 12 4 | |
| | | £33,928 0 11 | |
| *Less*—Provision for Amortisation | | 50 0 0 | |
| | | £33,878 0 11 | |
| II. SUNDRY DEBTORS | | 5 0 0 | |

#### LIABILITIES

| | | | |
|---|---|---|---|
| I. ACCOUNTS OUTSTANDING | | £15 0 0 | |
| II. PREPAID SUBSCRIPTIONS | | 10 0 0 | |
| | | £25 0 0 | |
| III. RESERVES, etc.— | | | |
| Glasgow Equipment Fund—Balance at 30th June 1948. | £60 4 0 | | |
| Provision for Current and Deferred Expenditure, for Books, Maps, Atlases, Binding Equipment, Furnishings and Exhibitions as at 30th June 1948 | 920 0 0 | | |
| | £980 4 0 | | |
| *Add*—Further Provision for above | 100 0 0 | | |
| Early Magazine Sales | 277 4 4 | | |
| | | 1,357 8 4 | |
| IV. GRANT FROM PILGRIM TRUST FOR BINDING | | 120 0 0 | |
| V. FUNDS OF THE SOCIETY— | | | |
| (*a*) LIFE MEMBERSHIP FUND— | | | |
| Balance at 30th June 1948 | £1,737 11 2 | | |
| Sums received during year | 309 6 0 | | |

| | | | |
|---|---|---|---|
| III. Cash in Bank and on Hand | | 533 11 9 | |
| | | £34,416 12 8 | |

| | | | |
|---|---|---|---|
| *Less*—Sum transferred to Revenue Account | | £2,046 17 2<br>102 6 10 | |
| | | £1,944 10 4 | |
| (*b*) Dr. J. G. Bartholomew Fund | | 1,000 13 6 | |
| (*c*) J. E. Touche Bequest— | | | |
| Balance at 30th June 1948 | | 608 1 4 | |
| (*d*) Ralph Richardson Bequest— | | | |
| Balance at 30th June 1948 | £25,689 15 7 | | |
| Sums received during year | 1,813 14 6 | | |
| | | 27,503 10 1 | |
| | | £31,056 15 3 | |
| (*e*) General Funds, including Bequests from T. F. Thompson, Dr. J. Currie, J. D. Munro, J. Bentley Philip, A. Geddes Scott, Miss Morrison, R. T. Skinner and Miss Julia Blanchard— | | | |
| Balance as at 30th June 1948 | £1,824 15 3 | | |
| Miss Ella Christie Bequest | 100 0 0 | | |
| | £1,924 15 3 | | |
| *Less* Deficit for year | 67 6 2 | | |
| | | 1,857 9 1 | |
| | | | 32,914 4 4 |
| | | | £34,416 12 8 |

## LIVINGSTONE MEDAL FUND

| | | | |
|---|---|---|---|
| Funds as at 30th June 1948 | | £1,646 10 10 | |
| Income Received—Interest on Stocks | | 47 17 8 | |
| | | £1,694 8 6 | |
| Funds as at 30th June 1949— | | | |
| £1,390 3% Savings Bonds 1965-75 | | £1,390 0 0 | |
| £123, 0s. 8d. do. 1965-75 | | 125 8 0 | |
| £100 2½% Defence Bonds | | 100 0 0 | |
| | | | £1,615 8 0 |
| Cash in Bank | | | 79 0 6 |
| | | | £1,694 8 6 |

## DR. M. I. NEWBIGIN MEMORIAL

| | | | |
|---|---|---|---|
| Funds as at 30th June 1948 | | £440 10 8 | |
| Income Received—Interest on Stocks | | 10 11 8 | |
| | | £451 2 4 | |
| Expenses *re* Medals | | | £6 15 10 |
| Funds as at 30th June 1949— | | | |
| £333, 18s. 6d. 3% Savings Bonds 1965-75 | | £339 6 6 | |
| £75 2½% Defence Bonds | | 75 0 0 | |
| Cash in Bank | | 30 0 0 | |
| | | | 444 6 6 |
| | | | £451 2 4 |

*Edinburgh, 9th August* 1949.—I have examined the Accounts of the Royal Scottish Geographical Society for the year to 30th June 1949, of which the above is an Abstract, and compared them with the Vouchers and Instructions thereof, and I find the whole to be correctly stated and sufficiently vouched and instructed.

J. A. ROBERTSON DURHAM, C.A., *Auditor.*